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ABSTRACT

The text of H.R. 3606, a bill to establish a National Institute of Education and for other purposes, and a summary of H. R. 33, The National Institute of Education Act, are provided. In addition, statements of educators and of those directly concerned with educational agencies of the Government are included. As stated in H. R. 3606, "The purpose of this Act is to establish a National Institute of Education to conduct and support educational research, and disseminate educational research findings throughout the Nation." The summary of H. R. 33 states that The National Institute of Education Act provides that the Secretary of HEW, through the Institute, shall: (1) conduct educational research; (2) collect and disseminate the findings of educational research; (3) train individuals in educational research; (4) assist and foster such research, collection, dissemination, or training through grants, or technical assistance to, or jointly financed cooperative arrangements with, public or private organizations, institutions, agencies, or individuals; (5) promote the coordination of such research and research support within the Federal Government; and (6) may construct or provide (by grant or otherwise) for such facilities as he determines may be required to accomplish such purposes. Supplemental material provided in the report include articles by Dr. Dwight Allen; Chicago Public High School for Metropolitan Studies--Rationale and Program; an article by Dr. Don Davies; articles and a report by Hendrik D. Gideonse; a paper by Dr. Klaus Hinst; a paper by Kenneth Komoski; an editorial by David Krathwohl; a report by Roger E. Levien; an article by Hon. Sidney P. Marland; and an Experimental Schools Program of the Office of Education. (DB)

TO ESTABLISH A NATIONAL INSTITUTE OF EDUCATION

HEARINGS

BEFORE THE

SELECT SUBCOMMITTEE ON EDUCATION

OF THE

COMMITTEE ON EDUCATION AND LABOR

HOUSE OF REPRESENTATIVES

NINETY-SECOND CONGRESS

FIRST SESSION

ON

H.R. 33, H.R. 3606, AND OTHER RELATED BILLS

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Printed for the use of the Committee on Education and Labor
CARL D. PERKINS, *Chairman*

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TO ESTABLISH A NATIONAL INSTITUTE OF EDUCATION

FEBRUARY 18, 1971

HOUSE OF REPRESENTATIVES,
SELECT SUBCOMMITTEE ON EDUCATION
OF THE COMMITTEE ON EDUCATION AND LABOR,
Washington, D.C.

The Select Subcommittee on Education met at 10 a.m., pursuant to call, in room 2175, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Meeds, Hicks, Grasso, Badillo, Scheuer, Quie, Reid, Landgrebe, Hansen, Forsythe, Peyser, and Veysey.

Staff members present: Jack Duncan, counsel; David Lloyd-Jones, professional staff; Marty LaVor, minority legislative counsel; Charles Radcliffe, minority counsel for education; Gladys Walker, clerk; Christina Orth, assistant clerk, Arlene Horowitz, staff assistant.

(Text of H.R. 3606 and summary of H.R. 33 follows:)

[H.R. 3606, 92d Cong., first sess.]

A BILL To establish a National Institute of Education, and for other purposes

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "National Institute of Education Act".

FINDINGS AND DECLARATION OF POLICY

SEC. 2. The Congress hereby declares it to be the policy of the United States to provide to every person an equal opportunity to receive an education of high quality regardless of his race, color, religion, sex, national origin, or social class. Although the American educational system has pursued this objective, it has not attained it. Inequalities of opportunity to receive high quality education remain pronounced. To achieve equality will require far more dependable knowledge about the processes of learning and education than now exists or can be expected from present research and experimentation in this field. While the direction of the education system remains primarily the responsibility of State and local governments, the Federal Government has a clear responsibility to provide leadership in the conduct and support of scientific inquiry into the educational process. The purpose of this Act is to establish a National Institute of Education to conduct and support educational research, and disseminate educational research findings throughout the Nation.

ESTABLISHMENT OF NATIONAL INSTITUTE OF EDUCATION

SEC. 3. (a) There is established in the Department of Health, Education, and Welfare a National Institute of Education (hereinafter referred to as the "Institute"). The Institute shall be headed by a Director who shall be appointed by the President with the advice and consent of the Senate. The Director shall perform such duties as are prescribed by the Secretary of Health, Education, and Welfare (hereinafter referred to as the "Secretary").

(b) Section 5316 of title 5, United States Code, relating to positions in Level V of the Executive Schedule, is amended by adding the following paragraph at the end thereof: "Director, National Institute of Education, Department of Health, Education, and Welfare."

FUNCTIONS OF THE INSTITUTE

SEC. 4. The Secretary, through the Institute, shall conduct educational research; collect and disseminate the findings of educational research; train individuals in educational research; assist and foster such research, collection, dissemination, or training through grants, or technical assistance to, or jointly financed cooperative arrangements with, public or private organizations, institutions, agencies, or individuals; promote the coordination of such research and research support within the Federal Government; and may construct or provide (by grant or otherwise) for such facilities as he determines may be required to accomplish such purposes. As used in this Act the term "educational research" includes research, planning, surveys, evaluations, investigation, experiments, developments, and demonstrations in the field of education.

EMPLOYMENT OF PERSONNEL

SEC. 5. The Secretary may appoint and compensate without regard to the provisions of title 5, United States Code, governing appointments in the competitive service and chapter 51 and subchapter III of chapter 53 of such title, relating to classification and general schedule rates, such technical and professional personnel as he deems necessary to accomplish the functions of the Institute.

NATIONAL ADVISORY COUNCIL ON EDUCATIONAL RESEARCH AND DEVELOPMENT

SEC. 6. (a) The President shall appoint a National Advisory Council on Educational Research and Development which shall—

(1) review and advise the Secretary and the Director on the status of educational research in the United States, and present to the Secretary such recommendations as it may deem appropriate for the strengthening of such research and the improvement of methods of collecting and disseminating the findings of educational research;

(2) advise the Secretary and the Director of the Institute on the development of programs to be carried out by the Institute and on matters of general policy arising in the administration of this Act;

(3) conduct such studies as may be necessary to fulfill its functions under this section; and

(4) prepare an annual report to the Secretary on the current status and needs of educational research in the United States, which the Secretary shall transmit to the President with such recommendations as he may make.

(b) The Council shall be appointed by the President without regard to the civil service laws and shall consist of fifteen members appointed for terms of three years; except that (1) any member appointed to fill a vacancy occurring prior to the expiration of the term for which his predecessor was appointed shall be appointed for the remainder of such term, and (2) the terms of office of the members first taking office shall begin upon enactment of the Act, and shall expire as designated at the time of appointment, five at the end of three years, five at the end of two years, and five at the end of the first year. One of such members shall be designated by the President as Chairman. Members of the Council who are not regular full-time employees of the United States shall, while serving on the business of the Council, be entitled to receive compensation at rates to be determined by the Secretary, but not exceeding the per diem equivalent for GS-18 for each day so engaged, including travel time and, while so serving away from their homes or regular places of business, may be allowed travel expenses, including per diem in lieu of subsistence, as authorized by section 5703 of title 5, United States Code, for persons in the Government service employed intermittently. The Director of the Institute shall also serve on the Council ex officio.

(c) The Secretary shall provide to the Council such professional, clerical, and other assistance as may be required to carry out its functions.

(d) The Council is authorized, without regard to the provisions of title 5, United States Code, governing appointments in the competitive service, and without regard to the provisions of chapter 51 and subchapter III of chapter 53 of such title relating to classification and general schedule pay rates, to employ and fix the compensation of such personnel as may be necessary to carry out its functions.

The Council is further authorized to obtain services in accordance with the provisions of section 3109 of title 5, United States Code, and it may enter into contracts for the conduct of studies and other activities necessary to the discharge of its duties.

GENERAL PROVISIONS

SEC. 7. (a) In administering the provisions of this Act, the Secretary is authorized to utilize the services and facilities of any agency of the Federal Government and of any other public or nonprofit private agency or institution, in accordance with agreements between the Secretary and the head thereof, on a reimbursable basis or otherwise.

(b) Payments under this Act to any individual or to any organization, institution, or agency may be made in installments, and in advance or by way of reimbursement, with necessary adjustments on account of overpayments or underpayments.

(c) The Secretary is authorized to accept gifts to the Institute and to apply them to carry out his functions under this Act; and is similarly authorized to accept voluntary and uncompensated services, notwithstanding the provisions of section 3679(b) of the Revised Statutes (31 U.S.C. 665(b)).

(d) Funds available under this Act shall be available for transfer to any other Federal department or agency (including constituent agencies of the Department of Health, Education, and Welfare) for use (in accordance with an interagency agreement) by such agency (alone or in combination with funds of that agency) for purposes for which such transferred funds could be otherwise expended by the Secretary under this Act, and the Secretary is likewise authorized to accept and expend funds of any other Federal agency for use under this Act.

(e) All laborers and mechanics employed by contractors or subcontractors on all construction projects assisted under this Act shall be paid wages at rates not less than those prevailing on similar construction in the locality as determined by the Secretary of Labor in accordance with the Davis-Bacon Act, as amended (40 U.S.C. 276a—276a–5). The Secretary of Labor shall have with respect to the labor standards specified in this section the authority and functions set forth in Reorganization Plan Numbered 14 of 1950 (15 F.R. 3176; 5 U.S.C. 133z–15) and section 2 of the Act of June 13, 1934, as amended (40 U.S.C. 276(c)).

APPROPRIATIONS AUTHORIZED

SEC. 8. There are authorized to be appropriated for the fiscal year ending June 30, 1972, and for each fiscal year thereafter, such sums as may be necessary to carry out this Act, which shall remain available until expended.

[H.R. 33 and related bills]

THE NATIONAL INSTITUTE OF EDUCATION ACT

SUMMARY

The National Institute of Education Act—

Establishes in the Department of Health, Education, and Welfare a National Institute of Education.

Provides that the Institute shall be headed by a Director who shall be appointed by the President, with the advice and consent of the Senate.

Asserts that the Director shall perform such duties as are prescribed by the Secretary of Health, Education, and Welfare.

Provides that the Secretary, through the Institute, shall: (1) conduct educational research; (2) collect and disseminate the findings of educational research; (3) train individuals in educational research; (4) assist and foster such research, collection, dissemination, or training through grants, or technical assistance to, or jointly financed cooperative arrangements with, public or private organizations, institutions, agencies, or individuals; (5) promote the coordination of such

research and research support within the Federal Government; and (6) may construct or provide (by grant or otherwise) for such facilities as he determines may be required to accomplish such purposes.

Directs the President to appoint a National Advisory Council on Educational Research which shall: (1) review and advise the Secretary and the Director on the status of educational research in the United States, and present to the Secretary such recommendations as it may deem appropriate for the strengthening of such research and the improvement of methods of collecting and disseminating the findings of educational research; (2) advise the Secretary and the Director of the Institute on matters of general policy arising in the administration of this act; (3) conduct such studies as may be necessary to fulfill its functions; and (4) prepare an annual report to the Secretary on the current status and needs of educational research in the United States, which the Secretary shall transmit to the President with such recommendations as he may make.

SECTION-BY-SECTION ANALYSIS

SECTION 1. SHORT TITLE. This section provides that this legislation may be designated by the short title of "National Institute of Education Act."

SEC. 2. FINDINGS AND DECLARATION OF POLICY. Congress declares it to be the policy of the United States to provide equality of educational opportunity to all persons regardless of race, color, religion, sex, national origin, or social class. In order to further this purpose the bill would establish the National Institute of Education to conduct and support educational research, and disseminate educational research findings throughout the Nation.

SEC. 3. ESTABLISHMENT OF NATIONAL INSTITUTE OF EDUCATION. There is to be established a National Institute of Education within the Department of Health, Education, and Welfare, under a Director (level V position) appointed by the President with the advice and consent of the Senate.

SEC. 4. FUNCTIONS OF THE INSTITUTE. The Secretary is directed, acting through the Institute, to conduct, and collect and disseminate the findings of, educational research (defined to include research, planning, surveys, evaluations, investigations, developments, and demonstrations in the field of education); to train individuals in such research; to aid such research through grants to, or other appropriate arrangements with, public or private organizations or individuals; and to promote the coordination of educational research and research support within the Federal Government. The section would also authorize the Secretary to construct or provide for the construction of facilities required to accomplish the bill's purposes. The Secretary may procure through appropriate contract any of the functions (such as the conduct of research) that the section would instruct him to perform directly.

SEC. 5. EMPLOYMENT OF PERSONNEL. The Secretary is authorized to appoint and compensate, without regard to the civil service and classification laws, such technical and professional personnel as he deems necessary to accomplish the functions of the Institute. The provision is modeled upon 42 U.S.C. § 1873(a), which provides a similar authority to the Director of the National Science Foundation.

SEC. 6. NATIONAL ADVISORY COUNCIL ON EDUCATIONAL RESEARCH:

(a) Provision is made for the establishment of a National Advisory Council on Educational Research. The Council would advise the Secretary and the Director of the Institute on the status of educational research in the United States, and present appropriate recommendations to the Secretary with respect thereto, as well as advise the Secretary and the Director on matters of general policy arising in the administration of the bill. The Council would also prepare an annual report to the Secretary on the current status and needs of educational research in the United States, which the Secretary would transmit, with his recommendations, to the President.

(b) The Council shall be appointed by the President without regard to civil service laws and shall consist of 15 members appointed for 3-year terms. Provision is made for filling vacancies and for staggering terms of office. Compensation is to be at the rate not exceeding the per diem of a GS-18.

(c) Professional, clerical and other assistance will be provided by the Secretary.

(d) The Council may hire personnel without regard to civil service requirements. Compensation of personnel is also determined by the Council. The Council may also enter into contracts for the conduct of studies and other activities necessary to discharge its duties.

SEC. 7. GENERAL PROVISIONS

(a) General administrative provisions which includes authority in the Secretary to utilize the services and facilities of other agencies of the Federal Government and of public or nonprofit agencies or institutions;

(b) Provision that payments may be made in installments, in advance or by way of reimbursement;

(c) Authority to accept gifts and voluntary services;

(d) Provisions permitting funds to be transferred to other Federal departments or agencies for use by such agencies for purposes of this act and provides that the Secretary is authorized to accept and expend funds of any other Federal agency for use under this act; and

(e) A provision making the Davis-Bacon Act applicable to construction project assisted under the bill.

SEC. 8. APPROPRIATIONS AUTHORIZED: The bill would authorize to be appropriated for the fiscal year ending June 30, 1972 and each year thereafter, such sums as may be necessary. Such funds would remain available until expended.

Mr. BRADEMAS. The Select Subcommittee on Education will come to order.

The Chair wants to observe that although all of the members of the subcommittees of the Committee on Education and Labor have not yet been assigned, we are nonetheless very pleased to welcome some new members of the Committee on Education and Labor to participate with us this morning in this hearing: the gentlelady from Massachusetts, Mrs. Hicks; the gentlelady from Connecticut, Mrs. Grasso; the gentleman from New Jersey, Mr. Forsythe; the gentleman from New York, Mr. Peyser. And we hope that they will feel free to participate in these hearings.

The chairman of the Select Subcommittee on Education also feels that this may be an historic occasion in that we are for the first time emulating the other body in allowing television cameras to invade our territory, and we are very glad to have them here. These are the first public hearings of a House committee covered by television since the Congressional Reorganization Act last year permitting such coverage.

The Select Subcommittee on Education today is meeting on H.R. 33 and H.R. 3606, bills to create a National Institute of Education to undertake and support research and development and innovation in education. This legislation arises from a proposal made by President Nixon in his message on education reform on March 3, 1970, to establish a National Institute of Education for the purpose of enhancing equality of opportunity in education and developing new and better ways for people to teach and learn at every level, from preschool to graduate school. The bill has been introduced by members on this committee on both sides of the aisle, including the chairman of the committee, Mr. Perkins; ranking minority member of the committee, Mr. Quie; myself; the ranking minority member of this subcommittee, Mr. Reid, from New York; and the distinguished gentleman from the State of Washington who has been a member of this subcommittee, Mr. Meeds; and some 20 members of the committee, both Democrats and Republicans.

The subcommittee plans to give this proposal its most serious and careful consideration. Relatively little money is spent on research on education in this country at the present time. In the field of defense, we spend 10 percent of all the money on research; but when it comes to education, we put less than one-third of 1 percent of our total budget into research and innovation and renewal. The proposed National Institute of Education is aimed at supporting the proposed research

and development and innovation to help change and, hopefully, improve, education at every level.

As President Nixon said in his speech last year, "As a first step toward reform, we need a coherent approach to research and experimentation. Local schools need an objective national body to evaluate new departures in teaching that are being conducted here and abroad, and means of disseminating information."

It is our plan, in considering this proposal, to listen to the views of representatives of a wide spectrum of opinion, both in education and related fields.

The present proposal was introduced nearly a year ago, but the results of a study of the possible structure of the institute, a study commissioned by the U.S. Office of Education and prepared by Roger Levien of the Rand Corp., has not yet been made final. Nonetheless, the subcommittee feels it is important to move ahead on this legislation. Following today's hearing, we shall, on Tuesday and Wednesday next week, hear the views of other distinguished authorities on the subject and shortly thereafter, we look forward to hearing the views of Secretary Richardson and his associates.

The Chair also observes the entry of a distinguished new Member of the committee to our hearings today, the gentleman from New York, Mr. Badillo, whom we are pleased to have here. The Chair wants to extend a warm welcome to the representatives of legislative commissions of the Parent-Teachers Association of the United States who are meeting in Washington today.

As one who is enthusiastic about the potential impact for good in our system of education of the National Institute of Education, I think that it is essential that the research it will in time support is directed to real problems in education—to real children, real schools, and real parents.

Second, the Chair wants to observe that he hopes that the introduction of this legislation and its support by the administration represent a significant, a substantial commitment on the part of the Nixon administration to support research in education, and we look forward to questioning the Secretary next month on that point.

The Chair also wants to welcome Mr. Landgrebe, a colleague from Indiana.

We are very fortunate today to have two outstanding authorities on education with us. First is an old friend of mine and the distinguished former counselor to President Nixon, a man who played a key role in the shaping of the President's National Institute of Education proposal, presently serving as professor of education and urban politics at Harvard University, and we look forward with enthusiasm to hearing from Prof. Daniel P. Moynihan.

Dr. Moynihan, we are pleased to have you here and look forward to your statement.

STATEMENT OF DANIEL P. MOYNIHAN, PROFESSOR OF EDUCATION AND URBAN POLITICS, HARVARD UNIVERSITY

Mr. MOYNIHAN. Thank you, Mr. Chairman.

Gentlemen and ladies of the committee, my name is Daniel P. Moynihan. I am professor of education and urban politics at Harvard University, and member of the faculty of public administration

of John F. Kennedy School of Government. At Harvard University I am a member of the Center for Educational Policy Research.

I am a member of the President's Science Advisory Committee, and a consultant to the President. And I am, for this year, vice president of the American Association for Advancement of Science.

What I am not, Mr. Chairman, is a competent typist, nor yet an even elementary speller. You have before you a copy of my testimony typed by hand, as it were, and if that is not sufficient evidence of the need for educational reform, I despair of making the point further.

It is, Mr. Chairman, a pleasant and appropriate practice for witnesses before committees and subcommittees of the Congress to express their sense of the honor of having been invited, and I most certainly wish to do this. I might also express my very pleasant surprise.

The President's message on educational reform was sent to the Congress just a few weeks short of a year ago. For a while there it looked as if it had as well never been sent at all, considering the response or rather nonresponse it evoked. At the time, I was a member of the administration and more than once found myself thinking of the occasion on which the clergyman said Sidney Smith met a friend of Fleet Street, "I am just on my way to St. Pauls to pray for you," said Smith, "but with no very great expectation of success."

The message, nonetheless, was sent in utmost seriousness and is, I believe, a statement that will find a place in the history of American education. For it was the first time a President undertook to speak about education, not in terms of simplistic pieties and lofty enthusiasm which have been the staple of public discussion of this subject, but rather in terms of the persisting failures of our educational system and the painful difficulties of choosing a feasible course of public policy by which to overcome such failures.

At the forefront of the President's proposal was the establishment of a National Institute of Education to serve as, in his words:

> A focus for educational research and experimentation in the United States. When fully developed, the Institute would be an important element in the nation's educational system, overseeing the annual expenditure of as much as a quarter of a billion dollars.

The primary thrust of the message was the need to shift the focus of public policy in education away from the inputs to the system, particularly the money spent on this or that, towards the outputs of the system, namely, the experiences of the children, for the most part what it is they learn, but other things as well, as, for example, how much heed is paid to their health. The President proposed that the NIE concentrate on six topics: New measures of achievement, compensatory education, reading, television and learning, and experimental schools.

The problem with the President's message, as with comparable studies and statements on this study made in the recent past, was that in effect it was reporting bad news. We had thought we knew all that really needed to be known about education in terms of public support, or at very least that we knew enough to legislate and appropriate with a high order of confidence. I realize this is a large generalization and the term "we" comprehends a good many persons. Yet I believe this to have been what you might call the operational reality.

As it happened, I wrote portions of the 1964 Democratic Party platform dealing with education, and was active during that period when

the first great Federal bills providing aid to elementary and secondary education were passed. I was a member of the group that drafted the Economic Opportunity Act of 1964 and, although at greater distance, was associated with subsequent development of programs of OEO. I recall these years with clarity. We knew what we wanted to do in education and we were enormously confident that what we wanted to do would work. That confidence, Mr. Chairman, has eroded.

We were not wrong to have felt as we did, and certainly neither the Presidency nor the Congress can be faulted for doing what was done. Not one whit. These were years of great national achievement, and anyone associated with that achievement, including many members of this distinguished subcommittee and perhaps especially yourself, sir, ought to be proud of their achievement, and the rest of us ought to be diligent in acknowledging it.

We have learned that things are far more complicated than we thought. The rather simple input-output relations which naively no doubt, but honestly, we had assumed to obtain in education simply, on examination, do not hold up. They are not there. Five or 6 years later now, we confront school systems that are seeming increasingly chaotic, even anarchic, and which are widely perceived as failing. It may just be that this is partly a result of the expectations induced by the rather simple faith that went into such legislation as Elementary and Secondary Education Act of 1965. Or the reasons may be altogether unrelated to anything done or tried in the past. But the facts are there. Things aren't very good, or don't seem very good to a great many persons, including a great many students.

I tend to think we have created some of this problem ourselves. Partly from a misreading of our history, partly from the increasing weakness or even failure of other institutions, we have in recent years imposed a formidable load of social purposes onto our school system. I am not sure it can sustain such weight in the best of circumstances. I am not sure schools have that much influence. But clearly there are some things which we need them to do, and if they are not doing them it is reasonable to ask what is required. In the past, the typical answer has been more resources. In the immediate future, I believe the answer must be more understanding, more knowledge.

There are those whose careers seem to be devoted to the proposition that these are antithetical goals; that to choose one is to reject the other. When the President proposed, in his message on educational reform, that a serious research effort was needed, it was predictable that a certain number of voices would be raised charging that what the administration really was saying was that it did not wish to put any more resources into education as such.

I would ask this committee to understand that this is not a pattern of reaction confined to the field of education. To the contrary, it is almost a standard reflexive response to a plea for more research in the social sciences, or at least it has become so of late. I have elsewhere suggested that there has indeed been something of a change here. For decades, even generations, social science enjoyed a comfortable relationship with what were perceived as progressive social policies. In recent years, this relationship has became troubled. Social science has emerged as a threatening discipline. It tells you a lot of things you thought weren't so, or wished weren't so. This is no way to win support.

Increasingly, the proposal for more research is seen almost as a hostile act. This, I think, was the way in which the President's message on educational reform was viewed in some quarters. Perhaps the best example of this process, one which members of this committee will be familiar with, was the rather sad sequence of expectation and disappointment which accompanied the Equal Educational Opportunity survey which Congress mandated in the Civil Rights Act of 1964.

This was the second largest social science research project in history. I think it fair to assume that those who sponsored it in the Congress and the very distinguished group of scholars headed by James Coleman, who carried it out, all felt confident that the conventional wisdom about educational processes was sound and that they would so powerfully demonstrate this fact in the context of unequal educational opportunity that a major force for change would be generated. But that is exactly what did not eventuate.

Try as they would—and they tried to the point of physical and emotional exhaustion—they could find only the very slightest support for what might be described as the educational theory underlying the Elementary and Secondary Education Act of 1960. It just was not there. Thereafter, a group of us at Harvard formed a seminar to examine the data and methodology of what had become to be known as the Coleman report. Professor Mosteller and I have edited a volume of papers that resulted from the seminar. It will be published next winter. I would hesitate to characterize the findings of all the scholars who have contributed to our volume, but I think it fair to say that the basic thrust of our findings is that Coleman was even more right than he realized, which is to say that the conventional wisdom was even more wrong than he was forced to report.

I chose those words with care. No one involved in Coleman's analysis took any pleasure in finding how very little educational effect could be traced to traditional measures of school quality, such as pupil-teacher ratios or levels of educational expenditure. That is simply the way the work came out. It produced, incidentally, evidence of the educational benefits of mixing poor with nonpoor children and mixing races. But, of course, the Office of Education could only be greatly disappointed. It took a lot of courage for Commissioner Allen, and now Commissioner Marland, to get back on that horse. Not to dwell on the subject, one could wish some others might show some of that same courage or might show some of the understanding, which you, Mr. Chairman, and Congressman Reid and others are doing today.

Let me invoke an old American saying, "It is not ignorance that hurts so much as knowing all of those things that ain't so." That is what has been hurting us in education. The hurt is a lot more serious than the temporary discomfort of having to give up some familiar belief. We had better get on with it. In a recent paper Kenneth Boulding described the schooling industry as a "possibly pathological section of the American economy." For 30 years now it has been getting a steadily greater proportion of our national product. Its share has more than doubled since 1940. Yet it would be hard to demonstrate that the amount of education has doubled or anything like it. Indeed, some charge—I doubt this, but it is stated—that levels of educational achievement have declined. In specific districts perhaps; but nationwide, I rather doubt that.

But if this is to happen, such men need help from Government. They need support of the kind a National Institute of Education would provide; that is to say, sustained and systematic provision of resources so that as much as possible a coherent research strategy is followed. The work involved can be utterly abstruse or painfully immediate and practical. We will have to experiment with actual educational systems as, for example, the proposal for voucher system, associated with my colleagues David Cohen and Christopher Jencks, which would introduce incentives and measures of performance into the teaching and learning situation.

Above all, what education research and education need from public men and those who comment on them is a measure of fortitude in face of disappointment. This is, of course, the central theme of my remarks this morning, and I would like to elaborate somewhat, Mr. Chairman.

Some of you may recall that the first domestic message which President Nixon sent to the Congress on February 19, 1969, concerned problems of poverty. In that message he drew attention to the great importance of early childhood experience in shaping subsequent achievement. These are years when children typically are not in school, years in which no very great social concern for the child is manifest. The President proposed this. He proposed a national commitment to the first 5 years of life. Specifically, he wished to establish an Office of Child Development in HEW, but generally to push forward on this front, exploiting the extraordinarily impressive findings of recent years as to the importance of these early years.

I quote his message, the first message the President sent to the Congress on domestic issue:

> In recent years enormous advances have been made in understanding of human development. We have learned that intelligence is not fixed at birth, but is largely formed by environmental influences of the early formative years. It develops rapidly at first and then more slowly; as much of that development takes place in the first 4 years as in the next 13. We have learned further that environment has its greatest impact on the development of intelligence when that development is proceeding most rapidly—that is, in those earliest years.
>
> This means that many of the problems of poverty are traceable directly to early childhood experience—and that if we are to make genuine long-range progress, we must focus our efforts much more than heretofore on those few years which may determine how far, throughout his later life, the child can reach.

The message also announced that he would transfer a number of OEO programs from the Executive Office of the President to regular departments of the Government on the grounds that these programs, once experimental, had now been worked to the point where they could be described as organizational and ought to be located in line with the organizational theory of how OEO would operate. The early drafts of this message included Headstart in this category of operation. It was being transferred to HEW, where in any event, if my recollection holds, the major proportion of preschool funds were already located.

Before the message was sent, however, word came to the White House from OEO that the preliminary findings of a major evaluation of the impact of Headstart carried out by Westinghouse Learning Corp. and Ohio University were disappointing. The pattern of earlier small-scale studies seemed confirmed: Headstart was not having much effect on educational achievement.

The reaction in the White House to this news was, I believe, under the circumstances reasonable. The designation of Headstart was

changed from "operational" to "experimental." All that would be shown, the message in effect stated, telegraphing the blow, is that we have got to try harder. Let me quote the specific passage:

Head Start is still experimental. Its effects are simply not known—save of course where medical care and similar services are involved. The results of a major national evaluation of the program will be available this spring. It must be said, however, that preliminary reports on this study confirm what many have feared: the long-term effect of Head Start appears to be extremely weak. This must not discourage us. To the contrary, it only demonstrates the immense contribution the Head Start program has made simply by having raised to prominence on the national agenda the fact—known for some time, but never widely recognized—that the children of the poor mostly arrive at school age seriously deficient in the ability to profit from formal education, and already significantly behind their contemporaries. It also has been made abundantly clear that our schools as they now exist are unable to overcome this deficiency.

In this context the Head Start Follow-Through Program already delegated to HEW by OEO assumes an even greater importance.

Now, one might have thought this reasonable behavior. But there were those who thought it was in some way—I grope for the word: Duplicitous? Disingenuous? Dishonest? Something as strong as that. One of the Nation's leading newspapers repeatedly suggested in its editorial columns, not only at the time, but as much as a year later, that the White House had somehow deliberately called attention to this dubious document.

The facts are simple. The White House was not even aware of the existence of the evaluation which had been commissioned under the previous administration. The preliminary findings were brought to our attention by a professional employee of OEO who thought we ought to know. The President's reaction was to argue that inquiry in this field was all the more urgent if it turned out that something we had put such hopes into was not quite working out.

Why did this respectable journal continue to question the integrity of the administration in this matter? I think I can answer this. We were dealing with the subject of failure, and there is none so painful in American life. Education traditionally has dealt with success and failure. The purpose of schooling was not just to instruct young persons, but also to some extent to sort them out into those who were bright and those not so bright. This is the process we associate with certification. There have always been big differences, not between groups in these matters.

My colleague David Cohen has shown that the school achievement of European immigrant groups was closely correlated to their degree of urbanization. Northern Italians performed better than southern Italians, and so forth. Jews scored highest in urbanization and highest in educational achievement. This would confirm work which Nathan Glazer and I have done on immigrant groups, but does not exhaust the number of phenomena to be explained.

How to explain the extraordinary achievement of immigrants from China and Japan? As I am not under oath, Mr. Chairman, I would venture that 50 to 75 percent of the intellectual energy being generated in the United States today comes from these three small groups: Jews, Japanese, and Chinese. Mind, I did not say moral energy or political, or economic. Other groups are not so fortunate. An occasional Greek gets a Rhodes scholarship. An occasional Irishman becomes a Fulbright fellow.

Mr. BRADEMAS. Dr. Moynihan, if you would allow the Chair to intervene, I would like to observe that two-thirds of the Rhodes scholars in the House are Greeks; the other third is the Speaker. And the Chair would also like to observe in commenting on that Irish Fulbright fellow that the majority leader of the House is Irish and that 66⅔ percent of the three whips of the House, given the appointments of Mr. O'Neill, Mr. McFall, and your humble servant, are Irish. So I don't know what that says for the Greeks and the Irish, but I am grateful for the observation.

Mr. MOYNIHAN. It says that the smart ones go into politics.

For the moment, educational achievement is rather unevenly distributed in America. No one likes much to talk about this inasmuch as educational achievement is so important to our "credentials society." Uneven distribution of such credentials is equivalent of uneven distribution of wealth in an earlier era and is just as sensitive a subject. To repeat, this matter will take fortitude in public officials. Yet I would plead that you do so.

One of the achievements of democracy, although it seems not regarded as such today, is this system of grading and sorting individuals so young persons of talent born to modest or lowly circumstances can be recognized for their worth. It provides a means for young persons of high social status to demonstrate that they have inherited brains as well as money, if that is the case. I do not doubt that this system is crude, and often cruel, and measures only a limited number of things. But it measures valid things, by and large. To do away with such systems of accreditation may seem like an egalitarian act, but it would be the opposite. We would be back in a world where social connections and privilege would count for more than any of us would like. If what you know doesn't count in the competitions of life, who you know will determine the outcome. This, to conclude, is what is at issue in the establishment of a National Institute of Education. We must master the art of education to the point that achievement is more or less evenly distributed among the different groups in our society and not too enormously varied within such groups. Not just equality of educational opportunity, although your bill, Mr. Chairman, very properly described that as the primary purpose of the Institute. But something like parity of educational outcomes is what we must achieve.

At this time the belief is widely held that the educational system can produce this outcome. It can't. At least that would be my reading of the present state of knowledge and resources. But the belief that it can is so deeply held that, when it does not, the repeated conclusion is that something of great value has been deliberately withheld. I do not know a more fateful formula for social unrest.

I repeat. The purpose of a National Institute of Education is to develop the art and science of education to the point that equality of educational opportunity results in a satisfactory equivalence of educational achievement. We have coming up a decade in which school enrollments will rise hardly at all. This means we will have resources of time and money in which to address ourselves to that far more difficult task. More difficult, that is, than simply building classrooms to accommodate the latest baby boom. We have the research skill and commitment. What remains, Mr. Chairman, is to summon the political will.

Thank you, Mr. Chairman.

Mr. BRADEMAS. Thank you very much, Dr. Moynihan. I think you have given us a brilliant, perceptive, and balanced opening statement, one to which I have little doubt we shall often be referring as we consider this legislation during the months ahead.

The Chair would just like to make a couple of observations quickly and then ask you a question or two. First of all, with respect to your comment that some persons saw the introduction of a National Institute of Education idea by the President as a hostile act, I want to say—especially since my distinguished colleague, Mr. Reid of New York, the ranking minority member of the subcommittee, is here—that within hours, indeed minutes after the President's message arrived, he and I had agreed that we would seek to cosponsor this bill, because we both saw in it the seeds of very great good for American education. And that we have so long delayed considering it, as we are beginning to consider it here today, I think is in no way related to our interest in the subject. But to be gentle about it, there have been changes in personnel downtown and it has taken a little time to get that house in order.

Second, with respect to your observation about the importance of taking seriously the findings of social science research, you specifically alluded to the findings of the Coleman report, and more specifically to Coleman's finding that poor children do better educationally when mixed with nonpoor children. Mr. Reid and Mr. Meeds and Mr. Hansen of Idaho here, and I might say other members of this subcommittee and full committee, have been working very hard this last year to put together a comprehensive child development bill which is in large measure premised precisely on that finding of the Coleman report.

I make these observations only so that you will know that there are at least some of us who have heeded your admonition this morning.

Dr. Moynihan, I was struck by your statement on page 14 when, in effect, you were suggesting, I think—and perhaps you would care to elaborate on this—with respect to the proposed Institute, that we may now be on the verge of very significant breakthroughs in educational methodology and research. Do I perceive that you are suggesting that if we make the kind of commitment represented by NIE, this could be the kind of impetus required to break out of the impasse in which we find ourselves?

Mr. MOYNIHAN. Mr. Chairman, is not possible to give you a confident answer, but I can give you my judgment, yes. Ten years ago you would not have been well advised to establish a large research basic effort in education. You probably would not have gotten out of it. There has been a great change in these 10 years. There are people in this field with a level of methodological sophistication and background we have to find out. There has been a merger between people doing different from even before. There has been a definition of what it is research on what happens in school system and what do you get for this and that, with people doing fundamental studies of what goes on in the chemistry of the brain when a child learns something. Something happens. They feel they are going to get it.

As I say, this kind of serendipity in science is not unknown. Fifty years ago there were fellows who thought they were going to get at the atom, and they did. I would say, sir, two things have happened. One is that there has been an influx into the field, not great, but a significant influx of men of large ability. I mean young men of great promise.

Secondly—and this is perhaps the most important thing—it has been discovered that most of what we thought we knew about the subject isn't so. This has a way of exciting the interest of people who only like hard problems. Educational research I think can fairly be said to have suffered for a long while from the thought that it was all done. If it is all done, you are not going to get many first-rate people in the field. Now finding out the kinds of things which you and Congressman Reid have been associated with, and the startling findings of the equal educational opportunity survey, has brought people in that just never would have bothered because they thought the work was all cleaned up and not worth their while.

Mr. BRADEMAS. Well, the impression that I have heard on this committee and in talking with some colleagues and with educators and others in the country is that educational research is really not very important. But I take it, Dr. Moynihan, what you are saying is that if we are first, really serious about getting more for the taxpayer's investment in education, to look at it purely in dollar and cents terms, which are not irrelevant in these matters; and that second, in substantive terms, if we want to help people learn more and learn more effectively, it is imperative that we give far more attention than we have been giving to the nature of the learning process. And you quoted Kenneth Boulding's statement to the effect that we really don't know very much about how people learn and teach.

I put this question to you for any further comment in order to try to raise the question of the relationship between what on the one hand, some people may say is an abstract, academic, cloudy, vague, cotton-candy phrase; namely, educational research, and, on the other hand, what really happens to real children and real schools and real teachers.

Mr. MOYNIHAN. Sir, I absolutely agree with you here. Let me put two points. First of all, when you are dealing with education, you are dealing with one of the sacred responsibilities of the democracy. We are only going to be as good as the next generation we educate and train to take over from us. The public men of this country have not been ungenerous about education. To the contrary, there is no society on earth that does so much in terms of expenditure, I think. We have doubled our expenditure in the last 30 years as a proportion of gross product. You have a further responsibility to try to see that the taxpayers get something for that extra money.

By and large, the school systems have not been able to deliver more education for the increased taxes which they have received. They haven't done that. But beyond that, sir, there is another problem. I alluded to it. Let me say it once again. With respect to the educational achievement of disadvantaged groups, right now we are promising things we can't deliver, and there is no better formula for social unrest. We are saying, "Watch! It is going to be great". And it does not happen and the sense of betrayal, I think, is real; the sense that this is a deliberate outcome rather than at at this point an unavoidable one is having consequences in every urban school district in America.

Pick up a morning newspaper and see where the latest disorder was.

Mr. BRADEMAS. The gentleman from New York, Mr. Reid.

Mr. REID. Thank you very much, Mr. Chairman.

First, I would like to welcome you most warmly here. I am delighted that you are back in Washington, and permit me, as one Member, to

commend you for the work you have put forth at the White House which was pioneering and creative. I would like to ask a few specific questions, after I make some comments, if I may.

First, I think that the President, with your counseling, focused on an extremely important matter when he talked about the importance of the first 5 years of life. And, further, I think the concept of serious research in education, embodied in this bill to create a National Institute of Education which would cover the whole gamut of research from preschool through higher education, is something that is badly needed.

I think that your remarks on page 15, where you talked about the challenge of getting some meaningful answers perhaps within a decade, is a challenge all of us should take seriously and a little bit hopefully. What I would like to ask you about particularly is about preschool, first 5-year period. You have commented a bit about the cognitive development, and we are trying to fashion a national day-care center bill which will deal not only with the learning process, however that might be defined, but equally with the proposition that nutrition and health and environment are all germane and relevant, and a hungry child or one without shoes on his feet or one with bad teeth is not likely to be the best student.

My question, therefore is: What are the elements that you think would be most helpful to support both the cognitive development and what you call the environmental impact on the development of intelligence? We have the late architect, Dr. Nutra, here talking about the design of a day-care center that would be compatible with departure from a home environment, indeed, from the home itself as a textual matter. How would you relate these different elements, therefore, of cognitative development and environmental impacts, nutrition, and health?

Mr. MOYNIHAN. Sir, may I say that I think you and Mr. Brademas and your colleagues are doing something brave and brilliant in trying to put together this legislation, trying to respond to what is simply new knowledge. Fifty years ago nobody knew this was so. It was just assumed that you started educating children when they were old enough to talk and they could walk and go to the bathroom on their own. Up until then, nothing was happening to them; that they were sitting in the crib gurgling. But they are not gurgling. They are learning how to talk. We didn't know this. Mothers knew it, but school principals didn't.

I would say three things. In terms of the kind of research, first, there is a level of research in this area which is extraordinarily abstract and important, that is, the kind of molecular biology that led to the discovery of DNA. We are beginning to have a sense of how the brain works, and there are men who really think we are about to get it. They know each other and they just need to be supported. You can't push them. They are going pretty fast, but, my good friend, they are close.

Second, you do need some fairly sophisticated clinical work, clinical psychology of the kind Brunel is carrying out in Harvard—and I believe you are meeting with him one evening—that is observing child behavior and noting patterns. They have found, for example, that one of the first things a child learns is when his arm has crossed the center line of his body, and that is when you begin getting that kind of

sense of left hand, right hand. That kind of work needs to be supported.

Finally, you need some just plain very good cost accounting of the actual operation of educational experiments. We change this input. What happens to the output? You just observe the actual experience of the day care center, or whatever the facility is. I would like to analyze it by the methods of regression analysis, and so forth, which we are pretty good at. I would like to say two things to you, sir, and this is hard felt, particularly in the aftermath of the Headstart experience. Don't expect to learn anything serious inside 10 years. It takes 18 years to produce an American citizen, or 18 years and 9 months, some people would say. You can't do some of these things quickly. You learn some things early, but not finally.

Second, I would hope that in going ahead with your proposal—and I certainly hope it does go ahead—that you confine the area of research to a fairly limited number of these enterprises. One of the difficulties with Headstart is that we have tried to go out and evaluate all Headstart programs. There are a number of thousands of these, no one of which is alike. You don't get good research out of that. You get good research by saying we are going to do a thousand of these things and we wish them all luck but there will be a few which we are really going to watch, we are going to instrument, we are going to calibrate and we are never going to let go. Concentrate your inquiry on a few and, for the rest, hope for the best. And then learn to recycle your findings among the rest.

Mr. REID. I think these comments are extremely lucid and helpful. Let me ask a final question. The research on DNA—and indeed the research on potential, if not actual brain damage, perhaps some of it prenatally as well as in the early formative years—certainly suggested the importance of balanced nutrition, it seems to me. And any such project, I think, nutrition has got to be part of any such project.

The other question that I would ask you: Would you not distinguish in your cognitive approach between what might be called compensatory education and what might be called going on from a certain level? I may not be putting it accurately, but there are so many children so far behind in basic training experience that they never really catch up with grade level in reading. And we have to factor in, if we take your goal hopefully, some equality of output at a certain point; this is the compensatory side as opposed to general improvement for one and all, isn't it?

Mr. MOYNIHAN. First, I agree with you completely about nutrition—and remember, we don't have to talk about brain damage in order to argue that it is a good thing to feed children. Let's just feed them.

Mr. REID. I would add, even in New York City today there are 400,000 children who do not get free lunch and breakfast, who do not get it and who need it. It is obvious as a Nation we haven't made the commitment to feeding the hungry.

Mr. MOYNIHAN. What is the matter with us? But on the point of fact on compensatory education, if I read your thinking correctly, we may get to the point hopefully in this country where we don't need

compensatory education, because people don't arrive at an institution behind, if you pick them up early enough.

Professor Kagan at Harvard has demonstrated very clearly that at different social class level by age 9 months the children are different. Don't let me be held to 9 months, but they already have different abilities reflecting their class and origin. These reflect money and environment, and so forth.

We have much to learn from the principle of preventive medicine. All of the great changes in health have come from preventive medicine. Doctors don't do much fixing up. They prevent. Compensatory education has proved enormously difficult. It almost never succeeds. We now know things we didn't know a decade ago as to why it never succeeds.

The problem originates very early, at the ages you and Mr. Brademas are talking about. We are beginning to know how to reverse it to see that it doesn't happen. A doctor out at National Institute of Health has been working with poor children here in Washington. He has been able to show a decline in IQ starting at about 18 months, in a control group, and he has been able to prevent that with the group he is working on. Having prevented the problem, you never have it.

Mr. REID. Thank you very much.

Thank you, Mr. Chairman.

Mr. BRADEMAS. Mr. Meeds of Washington.

Mr. MEEDS. Thank you, Mr. Chairman.

Mr. Moynihan, it is very good to see you again. And, as usual, you have never been one to shrink from controversy and you have made statements here today which I feel are very provocative and will undoubtedly embroil you in more controversy, and I am glad you have done so.

I think for years, ever since its inception in this country, we have felt that if we simply provide equality of educational opportunity that we have done our share in this country and that is sufficient. And I hear for the first time this morning someone say that merely providing equality of educational opportunity is not sufficient.

It seems clear to me, after and years of seeing that it hasn't provided real equality, you are saying we have to do more, and I am happy to hear you say that. I commend you for it.

Let me raise a question with you in terms of educational research. It seems to me that one of the big problems with educational research has been the length of time between the input and the evaluation, social evaluation—what happens to the child later. How do you suggest that we can compact evaluations so that we can determine from our research whether we are having any effect or not?

Mr. MOYNIHAN. Sir, I will not sound glib to you, but I suggest that the Congress in its legislative history of the NIE, say it would like to have some answers to that question. The basic problem, as I say, it that it takes a long time for a child to grow up, so what you do today you don't really appear to have consequences for 25 years or so. But it is entirely within the range of methodology technique today to begin seeing differences in rates of change very early on, and probably to make very accurate forecasts of where things will go.

This is the kind of thing which, if you give good men a little time and resources, they are likely to get you good answers. I absolutely

agree with you it is maddening always to be dealing with situations where almost in one lifetime you won't know whether what you did worked or not.

Mr. MEEDS. Do you suppose the National Institute of Education could be a prestigious organization which could give validity to some things that people have been saying for a number of years, for instance, that we ought to be doing more testing of young peoples?

We have some fairly valid methods of testing which we are not employing on a large scale because of social problems and political problems. Can an institute of education help us by focusing national attention on this and saying we ought to be doing more of this?

Mr. MOYNIHAN. I think you raise a very important question, sir, and I would hope the answer to that is yes. One of the things that distresses me is the sort of increasing hostility to testing, on the grounds that tests are somehow not valid. Well, this is a perfectly fair question to raise. Are they or aren't they? Are they culturally biased? Are they biased toward one group or another?

I think this is the kind of question you can put to National Institute of Education and know you are going to get a straight answer. It may not be the answer you like, but you are going to get an honest answer from the best men who work in the field, and the Congress and school board and PTA and the superintendent can say, "I am following the best practice known. That is where they came out at NIE, and I will stay with their finding. I don't know any better."

It gives officials, mothers and parents a sense of whatever they do they are doing it as the best impartial available practice.

Mr. MEEDS. Do you have any suggestions as to what the level of funding of the National Institute of Education ought to be? And if we can expect the administration to support your description adequate level of funding?

Mr. MOYNIHAN. Yes, sir. Obviously Secretary Richardson will be more to the point on that, but I believe it would begin at about $115 million a year, a good part of which would be brought from existing expenditures. I understand Commissioner Marland is already developing a nucleus of young people in OE who would fit into this kind of organization and beginning to have them think about it. I would say, sir, that you start these things out as it occurs. You can't start out full blast, but I would certainly hope to see—Dr. Levien has some statistics on this—I would say we ought to be spending at least a quarter billion dollars a year on educational research if we are going to spend $65 billion a year on education.

Mr. BRADEMAS. Will the gentleman yield?

Mr. MEEDS. Yes.

Mr. BRADEMAS. I believe Dr. Levien of the Rand Corp., who did the study commissioned by the administration on the NIE, suggested that by early 1980 we should be spending $1.1 billion.

Mr. MOYNIHAN. One point one, Mr. Chairman, but that would be over a 10-year rise. You would not start that way.

Mr. MEEDS. I would like to observe in parting here that if you can't be born Greek or Japanese or Chinese or Jewish, the best thing to do perhaps is to surround yourself with them. I married a Chinese girl. My campaign manager is Jewish and he is married to a Japanese, and I am a very good friend to the chairman here.

Mr. BRADEMAS. I thank the gentleman.

The Chair would like to recognize the distinguished ranking minority member of the full committee, who comes to this position for the first time this year and is widely recognized, as the principal Republican spokesman in the House of Representatives, if indeed not in either body, in the field of education, the gentleman from Minnesota, Mr. Quie.

Mr. QUIE. Thank you, Mr. Chairman.

I welcome you, Dr. Moynihan. I want to commend you for the tremendous assistance you have given to a number of administrations in giving them some leadership in their education efforts. I would like to follow up on Mr. Meeds' questions about the people who are presently doing research and the possibility of expanding this effort in research in education. Because I feel very strongly that we ought to make this dramatic expansion and produce about the same percentage of research in education as we have done in defense, I also recognize the tremendous benefits of research in agriculture and think what the Federal Government has done in research has been more beneficial than for all of the other programs put together for the American farmers.

I would like to talk about two things: the ones who are presently dong the research work, and the others who are building up a force of men and women who can carry this on. You can't expect to get it done in 10 years. That means in this decade we are going to be building up a group of knowledgeable people. Let's look at those who now are doing research. Are there some individuals who would like to do more research in education and have the capability and are there some who are doing research but the funds are so short that they are spending most of their time trying to locate funds?

Mr. MOYNIHAN. I think there are now unemployed resources in the field of educational research; yes, sir. I don't think this is as dramatic as some of those unemployed think, but we have more first rate men wishing to do work in this field than are now doing it. I think this is the case. I think we have got a fair amount of not very productive research going on, too, a fair amount of things that are not research at all. There are, sir, men who should be working in this field who aren't working in it.

There are good men who spend too much time filling out forms and getting to know associate commissioners, and flying back and forth to Washington to find themselves a little money. We have scientists doing the work that businessmen probably should do, but scientists shouldn't have to do that.

About new people coming into the field, I think I would say simply two things: One is that let's be very clear: Educational research has not been very prestigious. It has taken some very brave men to stay in the field. I can think of a dozen men who have stayed on in schools of education at some cost to themselves. There is a lot of fashion in science as in anything else, and there is a kind of Gresham's law: bad work drives out good work, and poor researchers drive out good researchers.

I have known men who, at costs to their reputation, have stayed in this field because they have known it to be so important. What the field needs is the kind of recognition Congress can give it. The kind of thing I was saying to Mr. Meeds, an institution of Washington, an insti-

tution of such unquestioned status that anyone interested in that institution is known to be running on a fast track. Once that happens I think you will have no trouble recruiting people, because it will have become an intellectually exciting subject.

Let me say to you, sir, that a couple of colleagues of mine have recently made a list of what they regard as major findings of social science in the last 40 years. Up until about 1930, up to 1940, two-thirds of those findings occurred in Europe. Since that time, two-thirds occurred in this country.

The overwhelming proportion, the big things that were found out, the important ideas, came because money was spent. It took money to find it out, because one man in a study doesn't do much any more. Where really important new things had been found, there had been an investment of adequate resources.

For instance, the Coleman study took many millions of dollars, but when it was over our idea of what the schools were like was turned upside down.

Mr. QUIE. Developing prestige in the Congress for educational research, is what Chairman Brademas is attempting to do, rather than quickly pass this bill. He wants to spend the year holding hearings and develop not only the public attention to it, but public knowledge about what is needed and what is possible. I commend him for this.

I think we can do a great deal, not only educating our own members—which is about as difficult a task as a person can find—but also to provide education for people of the country to understand it. Do you think, then in an effort to produce more researchers that most of this research ought to be conducted in our large institutions of higher education?

Mr. MOYNIHAN. Most of it probably should; yes, sir. I think the pattern of the National Institutes of Health, with which you are closely familiar, Congressman, has been a pretty successful one. I think we need some in-house people here in Washington or wherever they locate this center—but by and large, there are about 15 places in the country where the kind of work you are talking about can be done—and much should be put there. This is not something to be spread everywhere. Every county should not have its center. The things we are trying to find out, once found don't need to be found again. It is that level of science.

So, pick some strong places, places that are moving, and build with them. They are not all located by any means on the Eastern Seaboard. They are spread across the country.

Mr. QUIE. So an attempt to get political support is not the best way to get research that we want. We may be able to get some congressional support for a while, but you won't produce the results that would sustain congressional support.

Mr. MOYNIHAN. That is what we have agricultural research stations for, sir.

Mr. QUIE. I noticed they were at least limited to one per State, rather than providing several within the State. How do you then deal with the continued belief of some educators that, if you would reduce the pupil-teacher ratio, suddenly educational benefits would tremendously increase? I thought that would be well known among educators, but I am amazed by elementary and secondary school teachers who will not agree with me that changing the pupil-teacher ratio isn't going to change the educational output.

Mr. MOYNIHAN. Sir, every so often, even a Congressman as distinguished as yourself has to be told by a witness that something he proposes be done can't be done. Peter Rossi, at Johns Hopkins. has written a little paper about this. It turns out that just about the oldest continuing research inquiry in some behavior of this kind by psychologists has to do with the effects of pupil-teacher ratio. Since about 1922—the first work was done about that time—since that time we have had 40 or so really good papers on this: good stuff, good men. In the Coleman study, "Equality of Educational Opportunity," if you recall that tremendous thick book, he has a table on everything. There is nothing he doesn't have a table on. But he says there is no table on the effects of pupils-teacher ratio because, for all races in all regions, at all leevels and in all circumstances, the effect was zero.

That hasn't changed anybody's mind. The reason it hasn't changed anybody's mind is, that the effect of pupil-teacher ratio is not on the pupil, but on the teacher. They go crazy in a room with 50 people. I don't blame them for thinking that small classes are a good thing, but I would hope they wouldn't say they were doing it for the aid of children. They are doing it for themselves. They have rights. I don't know why a teacher should be driven crazy. But on the other hand. we shouldn't associate being decent with decent people with changing educational outcomes.

Mr. QUIE. Let me ask one other question, then, Mr. Chairman.

That is the problem we face when there is failure. You mentioned that quite a bit in your testimony here and commended those who had fortitude in the face of disappointment.

We will undoubtedly find failure in this research, like we have in many others, and this has worried me because sometimes the program goes down the drain if there is not a conditioning to accept the concept that you will have failures. From your observation over the years of administrations and Congress, do you think of anything we could do differently in order to condition at least our colleagues who have to vote on the money to be able to accept failures as well as the successes?

Mr. MOYNIHAN. Sir, yes; do more of what you are doing this morning. You did not walk in here promising the moon, saying: Just you wait, we are going to get this institute and in 4 years' time that will be the end of that subject.

I think we have all been chastened. I think you have certainly had a better record than most in saying: Don't expect the apotheosis of all possible expectation to come before the end of the calendar year.

I think this committee, if I may say so, Mr. Chairman, is going about its work in the terms that it ought to go about it. I think you are creating a legislative record which says: This must be a hard problem or it would not have resisted as many efforts as we have made. We will stay with it. We have faith in the scientific method. We have faith in our scholars, teachers, and administrators, and we don't expect success to happen overnight.

Mr. QUIE. It has been my philosophy that instead of trying to hide failures from the Congress and then the Congress suddenly discovers the failure, it would be better to be open about it and let the Congress and people know how the situation is progressing and tell

them beforehand. I look at it something like congressional trips overseas. If you don't say anything about it to your constituents and they find out about it in the paper, they think you are going on a junket. But if you announce it ahead of time, they think you are going on a worthwhile trip.

Mr. MOYNIHAN. The President tried to do that, and I would have hoped a little more attention might have been paid to his statements. In that first message to the Congress January 1969, he said:

> Let the men and women of the Federal Government understand that this administration does not expect every experiment to succeed; that there is no shame associated with failure, if you will learn from failure

And I think one of the great needs of government and particularly of the Congress, sir, is to make the people in the Federal branch feel they can say something doesn't work without feeling that they will lose their job.

Mr. QUIE. Thank you. You have been a good witness.

Mr. BRADEMAS. I am reminded, in view of the colloquy, Dr. Moynihan, of a late professor at Harvard, Raphael Demos, and having once heard him preach a little sermon in the college chapel about the subject of how to learn to fail, the point being that Americans learn only how to succeed and we are not emotionally or psychologically accustomed to the other.

The gentlelady from Connecticut, Mrs. Grasso.

Mrs. GRASSO. No questions, Mr. Chairman.

Mr. BRADEMAS. The gentlelady from Massachusetts, Mrs. Hicks.

Mrs. HICKS. Mr. Moynihan, thank you very much for coming this morning. What I am troubled about with regard to this, is, what sort of priorities are we going to have in the research program? You are going to be allocated, if this is funded, a certain amount of money. This morning we have been talking a great deal about the very young child and, of course, I am interested in him, too. But today I see the great need for some research to be done on the high school level. Because in my city, Boston, at the present time our high schools are closed, not for vacation but because of disturbances in the high school.

I would trust that this Institute, if it were so formed, would be able to do some work in this field on the high school level. We are not going to be able to reach these boys and girls on the infant level because they have gone far beyond us. Are you going to set priorities regarding the research or are you going to research on all levels at the same time?

Mr. MOYNIHAN. Well, Mrs. Hicks, you certainly are right in what you say about the high schools in Boston and Cambridge. I would say simply this: that first of all, the National Institute will respond to Congress. What does Congress want done?

The President has suggested some of his priorities: now what are Congress's priorities? There is no question whatever that one of the most difficult social problems in America is in that period of young adolescence. We aren't very good at making that shift in young people. We don't know much about it. We ought to learn a lot more. It has been wisely said by James D. Wilson that there are a lot of problem situations where you can't do anything about the causes until you cure the symptoms.

I think some of the high school behavior of young teenagers is such a problem. But in the area of research, I would hope that the Congress would respond to what it is the research community thinks is now important.

Mrs. HICKS. Also, I would like to know with regard to the research: how you are going to span the gap that is sort of between the research and the actual implementation on that classroom level?

Mr. MOYNIHAN. Mrs. Hicks, when we start acquiring hard knowledge, it will get picked up fast enough. I think this gap reflects not on the quality of the classroom teachers, but on the quality of the research that they are being told to get enthusiastic about.

But again this is a task for the Office of Education and should be very much a part of your charge to a National Institute of Education.

Mrs. HICKS. Another thing that you have talked about a great deal is the fact that your research would be done on graduate level, and so forth. Would you be selecting as researchers men and women out of the classroom who have faced the realities of the problems that you are going to try to solve?

Mr. MOYNIHAN. Well, with respect to some of this research, those people are actually indispensable. In other areas, biochemists, for example, you can be doing your work in Malaysia and it will be just as relevant as to the outcome.

Mrs. HICKS. Are we going to have any problems with Civil Service?

Mr. MOYNIHAN. Yes, ma'am. The men we want are not career civil servants. Some may choose to spend their life with the Institute. A more typical pattern would be to spend 10 years or so. These are professional men. I think Congress would be wise to follow the President's proposal to let these people be picked on their merits, which is basically by assessment of their colleagues. With respect to some people we are talking about, there aren't three or four men in the country who are capable of judging.

Mrs. HICKS. I wasn't afraid of selecting on the professional level, but rather on the civil service level. It specified that they would not be under civil service, and I wondered if you were going to run into any problem on this level.

Mr. MOYNIHAN. No, ma'am. Once you get to the nonprofessional employee, he should be a regular civil service employee.

Mrs. HICKS. Thank you, Mr. Chairman.

Mr. BRADEMAS. Mr. Landgrebe.

Mr. LANDGREBE. Mr. Moynihan, I am pleased to greet you today. I have heard you speak on many occasions. I don't think I have had the pleasure of having dialog with you before. A couple of comments to start.

On page 12 you mention that education's share of the gross national product has doubled since 1940. And you also go on to say it would be hard to demonstrate that the amount of education has doubled.

In other words, we have obviously spent a lot of money in the past on education that has not really gotten the job done, has not reached its goal. So it would seem that if an institute of this kind is the answer why wasn't it proposed years ago.

Mr. MOYNIHAN. Well, sir, you could certainly argue that. I would point out in response to your very necessary question that first in the President's list of priorities is measures of achievement. How do you

measure? We need some accountability out of our school system. You can tell how a political party did in the election. But how do you tell about a school system? It would be hard to demonstrate there would be more education going on. We don't have the measures necessary for that now.

One of the first things we need to start doing is to develop that. We have begun the national assessment, which is an effort to find out what do people know, and you are going to be talking with Dr. Ralph Tyler, Mr. Chairman, who has been such a great leader in that. But, my God, the resistance which that simple honest effort had encountered from school districts, professional educators and all. It wasn't very attractive.

Schools have to be accountable. That is not to say that they have to be accountable so they can be blamed but simply so you can find out what your child is learning and what your tax dollar is producing. We don't have to be fearful of these things. It is pleasant for me to see Congress talking about the subject, not in an adversary or hostile way, but in an encouraging way.

Mr. LANDGREBE. It looks like it is something we should be talking about, since people ahead of me here in this Congress have been appropriating substantially increased amounts of money, and obviously we have been derelict in not demanding proof that we are getting something for this money.

Now, one question: You have obviously spent a lifetime in education. Do you think this institute should have as its main goal teaching methods, or product? Answer me a very sincere question. Who determines what will be, what should be the product of our educational system? What kind of a person is it? How to succeed without trying? Is this the kind of person we are trying to develop? Is it method or product that we are interested in here?

Mr. MOYNIHAN. Well, sir, it is a little bit like asking who determines whether women's skirts go up or down. There are fashions and leaders in the fashion, but it is hard to put your finger on them. I think, by and large, the content of American education is determined in a pluralistic way. We have 20,000 school districts in the country. If you consider France, which in effect has one, I think the State of Hawaii has one——

Am I correct in that?

Mr. BRADEMAS. That is correct.

Mr. MOYNIHAN. But we have a very pluralistic arrangement. There are styles, and the styles of the 1930's are different from those of the 1960's. I like that. And I would say nobody determines what goes into education at a national level, and no one ever should.

Mr. LANDGREBE. Thank you.

Mr. BRADEMAS. The gentleman from New York, Mr. Badillo.

Mr. BADILLO. Dr. Moynihan, I know when I speak of the south Bronx area you know the area to which I refer, because you campaigned there with me in 1965 when you were running for city council president and I was running for borough president. You were very fortunate. You lost.

I am not committed to promoting social unrest, but I can think of no greater formula for doing so than if I were to go tomorrow—as I intend to—to a group of black and Puerto Rican parents in the south Bronx and tell them that they have to show fortitude in the

face of disappointment and that it may be 10 years before their children can expect to learn, because the educators really don't know what to do. I would suspect they would say that is not enough; that it is true that the educators don't know how to teach, but they haven't really tried; and that the disaster in education is not spread equally throughout the society.

It seems to me I would have to say something that would convey a greater sense of urgency, not just about a National Institute of Education—which I support—but in terms of really having a massive program and timetable as we did, for example, in the case of the moon shot—something that would indicate that there would be a greater desire on the part of the rest of the society to accelerate this process.

How would I convey such a sense of urgency?

Mr. MOYNIHAN. Well, sir, I went to school in east Harlem 30 years ago, and if we had known then what we know now we might be in different positions than we are today. The Congress has shown a real sense of urgency about this problem—the whole sequence of legislation which the chairman has been associated with, which Mr. Quie has been associated with—and it is not in any sense a case of saying that, because you need to learn more, you don't know anything. And I am not the least bit prepared to say that nothing is going on in the south Bronx. A lot is going on in the south Bronx. A lot of kids are learning things; a lot of kids aren't. When I was in school 30 years ago, it was about the same. There are probably some things you should not expect schools to do; and if you are saying you are going to do them, you are going to be disappointed. I think, we can lower a little bit the noise level about those schools, frankly—this is my own judgment which may be wrong, it is not a professional judgment. I am not a schoolteacher and am not a parent of children in those schools—I think the New York City schools that I went to were a lot poorer than those of today. But they weren't bad schools. And I think that is probably still the case.

They tried very hard. The teachers tried very hard. The thing is that some things take time. President Kennedy didn't say, "Let's go to the moon tomorrow." He said, "Let's go to the moon in this decade." And remember, most of the things you needed to know about getting to the moon, we knew in 1960. It was a great feat of engineering, not a science. We are talking about science here. Science doesn't come by pressing a button; it comes when it comes. Although you could make sure it doesn't come by not supporting it.

In going to the moon all you were fighting was the force of gravity. In education you have got people against you, as in Government and politics. You have conflicting desires and demands. The analog is a little misleading. But anyway, go up there and tell the mothers in the Bronx that they are doing damn well with their children and they ought to be proud of them.

My idea about systems is that they only work when people think they are working; they don't work when people think they aren't.

Mr. BRADEMAS. Mr. Hansen of Idaho.

Mr. HANSEN. Thank you, Mr. Chairman.

Let me join my colleagues in extending a very warm welcome to you, Dr. Moynihan. It is a great pleasure to see you back in Wash-

ington. I hope that this will be an occasion that will be repeated many times, because I am sure that in a great many areas we will have need to call on your extensive experience, particularly in education.

I was especially interested in your comments in the area of early childhood education and your reference to the President's announced commitment to the first 5 years of life that came in his first domestic message. You are familiar, I take it, with the legislation that our chairman has referred to, developed by members of this subcommittee in an attempt to honor that commitment. To what extent do you see in this Comprehensive Child Development Act a proper response to the need for education in these early years, as you see it?

Mr. MOYNIHAN. Sir, I probably ought not to comment on the specifics of that, but I would say that you are right on target. And I would say you are responding well, competently, generously to what is new knowledge. You have new knowledge, things that we never knew before, things we know now. What do we do about it? I would hope we would be clear that, on things like day care, there is a lot we don't know; and as we move into it, we ought to make sure we build an evaluation and measurement process into it. Because there is a lot we don't know.

Mr. HANSEN. Yes, that is one of the provisions of the bill. Another one that I would make reference to and ask a question concerning is the provision in our bill to establish a national institute of early childhood education, recognizing the urgent need for the very kind of concentrated and coordinated effort in the area of research in the early years as this bill contemplates for the whole education process.

In the event—and I hope this is the case—but in the event that this bill moves to final enactment fairly promptly and is implemented perhaps some months or even a year or more before the bill before us is signed into law—would you see any difficulty in folding in the proposed national institute for early childhood education into the proposed National Institute of Education?

Mr. MOYNIHAN. Yes, sir. There ought to be only one of these things. And I don't know why—I think, since this committee has jurisdiction, I guess I would hope that the committee would just have a National Institute of Education, of which, almost by definition, the biggest early focus would be on early childhood education, because that is where we seem to be learning most and seem to be doing least. I would urge you, sir, to have one institute, for obvious reasons.

Mr. BRADEMAS. Would the gentleman yield at that point?

Mr. HANSEN. Yes.

Mr. BRADEMAS. Perhaps Mr. Quie would hang on 1 minute for a question I would like to put to Dr. Moynihan, if the gentleman will allow me, that may be relevant in view of Dr. Moynihan's response to the question that Mr. Hansen put about the relationship between NIE and a proposed early childhood institute.

I wonder if you would have any comment to make, Dr. Moynihan, on another proposal; namely, the Foundation for Higher Education, the dimensions of which and purpose of which are not altogether clear to some of us on this committee who must also deal in another subcommittee with that issue.

It is not clear whether the foundation is meant to be—although I now perceive that is what the administration is moving toward—

an entity to stimulate research and exemplary demonstration programs in higher education, or if it is to be a legislative authority for ongoing programs. I understand the administration is moving away from the latter concept. But my question touches on the relationship between the Foundation for Higher Education and NIE.

Mr. MOYNIHAN. Yes, sir; these are two very different purposes. NIE is designed to accomplish a certain research task and diffusion of research findings. The National Foundation is designed to be a general purpose system of providing Federal aid to higher education, with some priorities set by the Federal Government, but avoid was the tiny definition of purposes which most Federal aid now proceeds upon.

The President said that for 30 years the Federal Government has been hiring universities to do work the Federal Government wanted done. This was good work—I am glad a laboratory of the University of California at Berkeley developed the atomic bomb. I am not glad we used it, but I am glad we got it. But such work has distorted the universities. They have been doing too much of what the Federal Government said it will pay for. The President said we have to restore some balance. Universities must get their own priorities, and they need support. The Foundation was designed to provide a general purpose support which would be directed by a board picked from outside the Government. It would set some priorities, but very general ones. It would not be designed to do a specific task which the Federal Government wants done.

Mr. Chairman, you are a Rhodes scholar and you are familiar, as some of the other members of this committee are, with the University Grants Committee in Britain, which is pretty much run by universities. It distributes the money that the National Government gives to the universities each year. That is the purpose of the Foundation, not to tell the universities how to spend their money.

The purpose of the National Institute of Education is to carry out a national task. We will hire people who will associate with that task. Is that clear, Mr. Chairman?

Mr. BRADEMAS. Your view of it is clear, Dr. Moynihan. I should only like to observe—and perhaps my question was not fair—that a number of conversations have taken place on the part of members of this committee, on both sides of the aisle, with people in the administration with respect to this matter, and the mission of the Foundation is at present not being delineated by the administration in quite the fashion you are suggesting.

This isn't perhaps the place to go into it, but the Foundation is presently being conceived, I think, by the administration more as a source of authority for innovative ideas in higher education, and not as a substitute authority for ongoing programs. And of course, the ongoing program to which you referred—which was scientific research—doesn't even come within the purview of this committee, as I am sure you are well aware.

So, I think further conversation is necessary on the part of all concerned on this matter. And now, if the gentleman from Idaho will yield to the gentleman from Minnesota.

Mr. HANSEN. I will be delighted to yield.

Mr. QUIE. I would say that you have expressed the view of the administration last year, but since that time there was a great deal

of reservation by people who are closely alined with some of the ongoing programs of the Higher Education Act. Community services is one of them and there are other authorized special programs, yet unfunded. There was an accusation that the administration used the Foundation then to phase those programs out and get rid of them.

It is my understanding they are going to ask for a repeal of the authorization of the ones that aren't funded at all, and then leave the other funded programs the way they are so they won't get that thing all confused. The Foundation will not be limited to innovative programs, unless the Congress as it begins its hearings on the Foundation wants to expand it further as you have suggested.

I have a feeling that there was a rethinking of the whole program last year. I wonder if there weren't some people who thought that it might not have fit well as a part of the Institute, too, as it went along.

Mr. MOYNIHAN. I was associated with both of these matters, sir, and I would think they really are different things. One, in the place of the Federal Government declaring a national purpose and getting it done; the other, the Federal Government moving away from closely defined conditions on which it will support higher education.

Mr. QUIE. Would you say in NIE the Federal Government will more closely define the research it wants?

Mr. MOYNIHAN. It will say: "We want to learn about education and we will only give money to people who will pursue this purpose. If your interest is poetry, don't come to this window, we don't have money for it here. Whereas, the Foundation ought to be responsive to things colleges think of as responding to their initiatives about what they would like to do, rather than Washingtons.

Mr. QUIE. That is the difference, you would say, between the Institute and the Foundation?

Mr. MOYNIHAN. Yes.

Mr. HANSEN. One final question, Mr. Chairman.

Are you saying, Dr. Moynihan, to the greatest extent possible, we should in the NIE legislation bring together all of the present Federal programs that sponsor the kinds of educational research that is embraced in the proposed Institute?

Mr. MOYNIHAN. I think so, sir. This subject is scattered around and "bootlegged" in a dozen places. I would bring it together and put it under the charge of a man who will have a coherent strategy.

Mr. HANSEN. Thank you.

Mr. BRADEMAS. Forsythe of New Jersey.

Mr. FORSYTHE. No questions.

Mr. BRADEMAS. Mr. Peyser of New York.

Mr. PEYSER. Thank you, Mr. Chairman.

Dr. Moynihan, I guess I don't qualify in the various breakdowns you established on higher learning by having the benefit of some of my colleagues up here of Rhodes Scholars and being of Greek descent. I did major in classical Greek in college, so maybe that gives me a little step on that, I am not sure.

Mr. BRADEMAS. It does.

Mr. PEYSER. Thank you.

I can think of no topic that the concerned public has a greater interest in than this whole field of education today. I am wondering if it is the intent or the function of the National Institute of Education pro-

gram to keep the educational community and the involved public closely informed on what is really happening on a regular basis. I feel one of the problems of so many of the Government programs, particularly in this area, is that even the interested public and the educational community at elementary and secondary levels, particularly, don't know what is happening.

Do you feel this is a real function of this act, if it is going to be approved?

Mr. MOYNIHAN. It is a vital function, sir. You should make it a matter of the legislative history of this bill that you want it to be a function. There are two reasons: One is, there comes a point when a subject is coalescing enough where you have to have a place where people can find out what is going on. Second, there will come a point when there is just a very great fear of disclosing findings that are not positive on reasoning. Well, we have to break out of that, because we don't get anywhere telling ourselves lies. We are grownup people, and we welcome truth. We need a place that will do it and not have to feel "If we say this, that is the end of our program."

Mr. PEYSER. I hope this is going to be the way it is handled because I think it is of great importance. I have talked to elementary school principals about areas in education today, and in a large number of cases they have no familiarity with what new is happening in higher education today. And I think, mainly or as a part, the cause is that there is no way they get this information from agencies such as we might be creating here.

Thank you.

Mr. BRADEMAS. Thank you.

The gentleman from New York has made a very telling point with respect to the importance of stressing dissemination of the fruits of research. One of the reasons, I think, that educational research has had trouble winning support in Congress, is an apprehension on our part that research is done and then sits on a shelf and never gets out into the communities that are the users. I take it, that is the point of the gentleman.

Dr. Moynihan, you have been enormously helpful in stimulating and provoking our thinking on this very important subject. We are deeply grateful to you for having come, and hope that you will let us impose on you another time later in the year perhaps. And, in any event, I hope that perhaps we can come to visit you and your associates at Harvard, where we can have a chance to talk in still greater depth.

Thank you very much indeed.

Mr. MOYNIHAN. Thank you, Mr. Chairman.

Thank you, members of the committee.

Mr. BRADEMAS. Our final witness today is Dr. James Gallagher, the director of the Frank Porter Graham Child Development Center, University of North Carolina, and formerly the Deputy Assistant Secretary of Health, Education, and Welfare in charge of planning, research, and evaluation, and a man with long experience in the subject matter of the legislation before us.

Dr. Gallagher, we are pleased to have you with us. We regret that we have taken so long to get to you, but you will appreciate with our first witness we were all anxious to question him at some depth. And I am sure we will be anxious to question you, as well. Go right ahead.

STATEMENT OF DR. JAMES GALLAGHER, DIRECTOR, FRANK PORTER GRAHAM CHILD DEVELOPMENT CENTER, UNIVERSITY OF NORTH CAROLINA

Mr. GALLAGHER. Thank you, Mr. Chairman.

I did detect a certain tinge of Gaelic in the witness list this morning. I will try and make my points brief and to the point, and not go through the actual written testimony.

Mr. BRADEMAS. Without objection, the testimony will be printed as if read at this point in the hearing.

(The statement referred to follows:)

PREPARED STATEMENT OF JAMES J. GALLAGHER, DIRECTOR, FRANK PORTER GRAHAM CHILD DEVELOPMENT CENTER, UNIVERSITY OF NORTH CAROLINA, AT CHAPEL HILL

My name is James J. Gallagher and I am director of the Frank Porter Graham Child Development Center at the University of North Carolina at Chapel Hill, N.C. My particular interest in the National Institute of Education and its goals stem from my three years of experience in the Office of Education first as Associate Commissioner of Education in charge of the programs for the Handicapped and then as Deputy Assistant Secretary in charge of Planning Research and Evaluation. These experiences have caused me to be most enthusiastic about the potential of the National Institute of Education. This enthusiasm is tempered by the many different conditions that must occur before such an organization can hope to become an effective instrument of educational reform. I hope to share with you today both my enthusiasm and some of the conditions that, I believe, will create a viable National Institute.

There are several important facts that can put the educational research and development operation in the United States into perspective:

1. The federal government is the prime contributor of resources for educational research and development. A recent survey[1] indicated that over 85% of educational R&D money was provided from federal sources.
2. Support for this activity is quite recent. The Cooperative Research Act, which eventually became Title IV of the Elementary and Secondary Education Act, did not reach the 10 million mark until 1964 and reached fifty million in 1966 coincident with the funding of the ESEA.
3. The percentage of funds spent on R&D relative to the total costs are one tenth that allotted in fields of health sciences, industry and defense (about .4 of 1%).

IMPACT OF RESEARCH ON EDUCATION

One of the questions often asked is, does research and development make a difference? Does education change as a result of research? The answer to that question is, *Yes*, but that such change rarely occurs as a result of a single study or independent of other influences operating at the same time. Rather, such change comes from an accumulation of research on a particular topic and takes place through a kind of osmosis where the ideas seep into the educational establishment through convention papers, university courses, popularized articles in the mass media, etc. Often when an educational administrator adopts a new educational practice he may not, himself, be aware that the new approach stems from research done a half decade before. Some clear examples of research impact on the educational scene could be mentioned briefly.

Studies on autocratic vs. democratic leadership patterns helped change the teacher-pupil learning atmosphere in many schools so that students now participate more actively in the learning process.

Recent studies on the nature of creativity has sensitized many schools and many teachers to the imaginative and divergent thinking processes of children and how to stimulate them.

Studies on the special problems and plight of black students helped to set in motion major societal changes devoted to redressing some important educational imbalances.

[1] Gideonse, H. *Educational research and development in the United States*. U.S. Office of Education, Washington, D.C., 1969.

Thirty to forty years of research on the learning process have been utilized to develop programmed learning efforts which allow students to pace themselves and progress at their own rate more effectively.

Important longitudinal studies on gifted students have helped to dispel an array of mistaken ideas and myths concerning those children who provide a major source of future leadership for our nation.

Innovative use of media and technology with handicapped children have revealed that they can learn effectively many important skills previously denied them if we but use our own ingenuity in devising new educational methods and materials to instruct them.

CHANGING NEEDS

The entire nature of Educational Research and Development in the U.S. has been changing most rapidly, considering that the effective funding did not exist before 1966. Clearly defined trends are as follows:

1. More long range and large projects.
2. More emphasis on development rather than research.
3. More emphasis on targeted research directed to a specific objective, rather than a free marketplace of projects determined by the researchers themselves.

All of these trends will require great tact and delicate handling of the various forces in the educational community that are affected. It will require systematic planning to meet long term objectives and this, in turn, will demand full utilization of educational and scientific leaders in such planning. It is not conceivable to me that, under current Office of Education circumstances, such leadership can be provided. This is not a negative comment on the new leadership personnel in OE but is rather based on my understanding of the limitations of their situation.

PERSONNEL

One of the most important changes that a National Institute of Education will provide is a team of high level professionals that can contribute effective management and leadership to a continuing effort at educational reform. The current status of the personnel in the research program within the Office of Education does not match these responsibilities. One clear measure of practical priority is the number of supergrade positions (GS–16 and above) that is allotted to a program. Currently, the research program in the Office of Education is allotted four supergrade positions. These can be compared with fifty positions at the supergrade level in the Nation .l Science Foundation, with only 4 times the budget of OE, and eighty-nine positions at the supergrade level in the National Institutes of Health.

Good programs are designed and managed by good personnel and many of the complaints from the educational field that has been heard in the past fe-' years have their origin in the inability of the Office of Education to match the quality of the applicant or field researcher with a similar quality in the federal staff who monitors his work.

The proposal for the National Institute places an important stress on the need for high level personnel to provide wise leadership for the major program thrusts that must come in the years immediately ahead of us.

GOVERNMENTAL AMNESIA

While there are some parallels to be drawn between the current National Institutes of Health and the proposed National Institute of Education there are some important differences as well and these differences need to be recognized when management and organizational plans are being made for the NIE. The National Institutes of Health are still generally committed to a policy of major support for basic research, for the seeking of knowledge for its own sake, with trust in the eventual usefulness of such knowledge to solve important health problems.

The directions in educational research and development have clearly been in the direction of more development. More than one out of every two dollars are now spent in OE is spent on educational development, as opposed to research. While research is the quest for new knowledge; development is the planned production of materials or programs for use in educational settings, with different management needs.

The management of a pure research program often consists primarily of getting good consultants to help make decisions on whether the proposed research has scientific merit or not. Decisions on development clearly are made in terms of agency priorities and here we have not yet devised a good management procedure to assure that the educational consumers (the administrator and educators), as well as producers, will have some say as to the products that will be generated. The consumer must play a key role at all levels of policy development.

Since development costs run about ten times that of the usual research projects, decisions as to what to support in this domain are crucial to the effectiveness or noneffectiveness of the total program effort. The decision-making that has taken place has been a blend of the old method of making decisions on research projects (peer approval) and agency decisions that have contributed to the single more pressing issue in R&D today—the problem of *governmental amnesia*.

The National Institute of Education must, if it is to be a success, meet this problem of *governmental amnesia* about past priorities.

The history of government priorities is that they will change about every two or three years, often coincident to the major changeover of leadership staff in an agency such as the Office of Education. But major research and development efforts in education often take from five to ten years to complete. This means that by the time the R&D effort is in full swing, it has lost its priority position and is in great danger of having funds drastically cut back and its effort blunted in favor of the new priority, whereupon the whole depressing sequence starts all over again.

If the National Institute of Education can establish some degree of protection that will allow major priority programs (assuming pehaps 20% of the total budget) to complete a five year cycle, the money and personnel resources will be much more satisfactorily spent. Once there has been a commitment to a priority, and strong quality control standards applied in selection of recipients, then the program should be allowed to run its course without a semiannual threat of dismemberment or major cut in budget that causes them to reprogram all of their plans and activities. This requires a degree of self control in both the Executive branch and Legislative appropriation committees to follow through on past commitments. But the present practice of pulling the plants up by the roots to see how it is growing every six months has caused great dissention and disillusionment among those committed to educational research and development in the country.

We must be wise enough to understand that not every project will be a success. It is not in the nature of research and development in any field to be always significant or important. Not every rocket followed a true course in the space program nor does every vaccine extract turn out to be a life saving one. There are many failures and disappointments awaiting those who step from the familiar ground of status quo education to the frontiers of knowledge or practice. It is the excitement and uncertainty of discovery that is attractive to those who work in this 20th Century frontier. The risks are great enough and don't need to be compounded by inconsistent government policy.

COST

We now have garnered enough experience in the field of educational research and development to provide some rough per unit costs of major projected efforts. If we can clearly state our R&D objectives, we should be able to make some judgment as to approximate cost. Table 1 on page 8 gives some estimates as to what one could expect to buy with additional sums of money and how long it should take before expected delivery. A major national curriculum project which attempts to reconstruct major elements of the existing program such as a new mathematics program or a new social studies curriculum or a new curriculum to meet special needs of disadvantaged students would cost about 10–15M dollars. This is what such efforts have cost in the past and these sums are uncorrected for inflation.

Sesame Street costs have run 8 million dollars for their first series and promise to run a good deal more for their second effort now in progress. A major effort at National Assessment now underway for about five years, and still having four years to run for initial data collection across ten areas, will cost about 35–40 million dollars.

One of my most serious concerns about the National Institute of Education is the danger that it would be established with the usual enthusiastic rhetoric but with

resources that would not even approach what is needed to do the tasks assigned it. After two or three years we could then expect to hear the noises of disappointment growing louder and a feeling would be abroad that one more noble attempt has failed. I believe that the seeds for potential failure are contained in that Table on costs, plus a set of objectives that runs wildly beyond what is appropriated.

TABLE I.—ESTIMATED[1] COST FOR EDUCATIONAL INNOVATIONS

Type of innovation	Cost (in millions)	Delivery time (years)
Major curriculum projects (such as BSCS, new mathematics, etc.)	$10-$15	5-7
New innovations in media and technology (such as "Sesame Street," computer assisted instruction	10-15	3-5
New efforts at assessment—accountability (national assessment program, Belmont project)	15-20	8-10
Experimental schools	(2)	5
Major studies in financial reform	5	3-5
Training 100 senior researchers	6	4-5

[1] Estimates provided from National Center for Educational Research and Development, Office of Education.
[2] $5,000,000 each.

How much can 25 million buy? That is the question. Let us say that our objective is to improve urban education. *One* major curriculum effort and one major innovative effort in the use of mass media would be about all we could afford for that price tag. This means that we would not be able to spend additional money on R&D in vocational education programs or early education or the special problems of the deaf or mentally retarded or higher education reform or new models for rural education.

One of the most constructive areas of questioning that this committee might wish to pursue with future witnesses might well be the cost estimates that they would put beside their objectives for the NIE. It is all very well and good to wish to reform the elementary school program, introduce new preschool programs, provide new curriculum for community colleges, and new systems for computer assisted instruction and so on. But all of these efforts carry expensive price tags and we must first decide, are we going to finance this operation in such a way that there will be reasonable confidence that such tasks as we set for it will be carried out?

If the new Office of Management and Budget operates in a similar fashion to the old Bureau of the Budget, which I viewed with restrained affection, it can wave its cape and all of a sudden one hundred million dollars will appear in the National Institute of Education budget. Only those in Washington will know that it is merely a transfer of existing funds in the Office of Education budget to a new budget line with no actual new money committed at all. It would be a cruel hoax to suggest that that hundred million dollars could be used for these new objectives. A large proportion of that money will be continuation of past research activities that must be continued or else the government will again be quite properly accused of more broken promises and commitments.

It would be a great surprise to me if more than 20 million of that total figure would be really available to meet some of these new ambitious objectives. Rather than suggest a particular figure for an increase, let me suggest that we place a price tag on the proposed activities of just one of the 15 suggested program elements for the new Institute—Improving Education of the Disadvantaged, presented in the excellent planning document produced by Roger Levien. The suggested program includes basic studies on causes of educational disadvantage, curriculum projects, major programs in early childhood, experimental schools, new measuring instruments and transmittal of research. A crude estimate of costs would be 125 million for that one objective. Cost for the 14 other objectives would be worth calculating on a more systematic fashion that I have been able to do.

DELIVERY SYSTEM

One of my continuing concerns which includes both the current bill and the administration plans (as shown through the Levien report) is the limited attention paid to the delivery of finished product or discoveries to the educational consumer, to the administrator, the teacher and the student. Putting it very pragmatically, if we developed an excellent reading curriculum in Phoenix how can

we get it to Minneapolis or if there is a fine mathematics program in Los Angeles how can we get that to Winston-Salem or Peoria. This is no educational transportation system.

What we wish to transport is not just information but complex systems of behavior where the teacher will have to interact sequentially with students and so the communication that makes a difference will involve demonstration and training. Previous limited efforts at transmitting new discoveries or new programs have been tried through the establishment of demonstration centers that illustrate the new program in action; through the design of special centers such as the Special Education Instructional Materials Network; through the establishment of Regional Educational Laboratories. All of these experiences come back with similar messages.

1. We consistently underestimate the complexity of the change process in education.

2. Program change, when it takes place, usually occurs because a personal relationship has been established by the person selling change and the educational customer.

3. Unless systematic channels of communication involving personal contact are established, the changes will be difficult to maintain, even if started.

4. It is hard to find those elements in the new programs that are so rewarding that they will overcome the fears and anxieties raised by departing the educational status quo.

Yet without a specific plan for how to deliver the products of the educational research and development efforts we will continue to have a huge chasm between educational innovation and educational implementation. One of my strongest recommendations therefore would be to have the planning for a National Institute of Education become intimately involved in the search for, and demonstrations of, a modern educational communication system, and to budget for it. The cost of this transportation system to build regular communication between the developer and the consumer is likely to be very large, and there is nothing in current budgeting that shows a recognition for this crucial problem. The National Center for Educational Communications in the Office of Education currently carries a budget of less than ten million dollars, enough perhaps to run an information dissemination system such as ERIC, but not to stimulate major innovations in the transportation of new practices. State departments of education and even regional service centers may have to become involved in such a total program. My concern is not that we have an answer that no one is listening to, but rather that too few persons seem to understand that failure to come to grips with this issue will cause much of the other efforts in NIE to be less than totally efficient.

We all realize that a single Institute with a $200M budget is not going to, by itself, reform the 65 billion dollar disconnected enterprise we call American education. It can be, though, an important catalyst to start many needed changes. I applaud the efforts of this committee to stimulate a new and necessary chapter in American educational reform.

Mr. GALLAGHER. I applaud this committee's effort to get wide-ranging testimony on this bill. Instead of going into the many different aspects of it I would like to concentrate on three things.

One is that as the research operation is currently designed, the Government is compulsively required to break its promises to people.

Second, that there is insufficient understanding about the cost factors which are involved in educational research.

Third, the matter of delivery systems which has been brought up. What is important is: How do you get new ideas in the classroom.

I would like to focus on these three points. There are a certain number of facts that are worth recalling. One is that the Federal Government is the prime, and perhaps the only, major supporter of educational research and development in this country. Some 85 to 90 percent of the funds spent on educational research and development are spent from the Federal Government. If the Federal Government doesn't provide the funds in the current situations, these funds are not available.

Second, from a standpoint of age, this whole educational research and development program is quite new. It has had about its fifth birthday, really, because it got funded at a significant level only in 1966 when it became title IV of the Elementary and Secondary Education Act. Before that time it was below the $10 million mark, which meant that only small, unconnected kinds of research projects were funded which couldn't possibly have major impact on educational systems.

Third, it has been mentioned that a very small percentage of the funds in education are being spent on research and development. I have some points in the written testimony about the impact of research and development on education which is very real and can be documented. I won't go into that now.

What I do want to say, however, is that on the basis of my own experience in the Office of Education, it will not be possible to provide the kind of leadership that the research and development area needs in the immediate future. There are changes which are now taking place in the direction of more long-range and larger projects and more emphasis on development than research.

Professor Moynihan spent a great deal of time talking about research and new knowledge. One of the real problems in education is the translation of research into programs. We know a great deal about how children learn. The question is how do you put that into a program of instruction in a history course or in a course on American Government or in science.

What we are talking about in terms of the major trend in development is that more than one out of every $2 now being spent in the Office of Education is being spent on program development rather than research. That means the development of a specific product or a specific program that should go into the educational system. One of my great concerns in the Office of Education was that we did not have the kind of high-level professional status that was required of our responsibilities in this particular area. One easy index of influence is the number of supergrade positions that you have in the Government. In the Office of Education, in the research programs there, there are four supergrade positions now, GS-16 or above. You can compare that with National Science Foundation, which has 50 supergrade positions, and a National Institute of Health which has 89 supergrade positions.

You just have to accept the fact that good programs are designed and managed by good personnel. It is very difficult to undertake a very sophisticated operation, such as we are talking about here, with limited high-level staff.

One of the points that is of continuing concern to the people in the field is the matter of governmental amnesia. The National Government, by the way, in which it makes decisions, is compulsively required to go back on previous commitments. The history of the Govment priorities is that they are going to change every 2 or 3 years.

Now, what Professor Moynihan was talking about and what I believe is quite true, is that any major research and development activity is going to take from 5 to 10 years. So that means by the time the R. & D. effort is in full swing it has lost its priority position, it is in danger of having funds drastically cut back and effort blunted in favor of a

new priority, and the whole sequence starts over again on the new priority. The priorities disappear before the programs can really get underway.

If a National Institute of Education can establish some degree of protection that wil allow major priority programs—perhaps 20 percent of the total budget—to complete a 5-year cycle, the money and personnel resources will be much more satisfactorily spent. Once there has been a commitment to a priority and you have strong quality controls, then the program should be allowed to run its course without a major cut in the budget that causes them to reprogram all of their plans and activities. This requires a degree of self-control in both the executive branch and the legislative Appropriations Committee to follow through on past commitments.

In terms of cost, we know enough about what various kinds of products cost in education to make a reasonable estimate. I have on page 8 of the testimony the estimated costs for various kinds of educational innovations. So you can figure out what it is going to cost you to obtain certain kinds of specific products.

A major national curriculum project will cost $10 to $15 million. That is what such efforts have cost in the past, and that is uncorrected for inflation. "Sesame Street" that everybody refers to as a success, has now spent $8 million. They will have spent $15 million by the end of the current year. Major effort in national assessment referred to by Professor Moynihan will cost $35 to $40 million by the time it has completed its effort.

So one of my most serious concerns about National Institute of Education is the danger that it would be established with the usual enthusiastic rhetoric, but with resources that won't approach what is needed to do the tasks assigned to it. After 2 or 3 years, we will hear noises of disappointment and critics saying that the organization didn't do the job. I believe the seeds for potential failure was tied up in that table on costs, together with a very modest increase that is being proposed for funds in educational research for the National Institute. How much will $25 million buy when you get right down to it? They will buy one major national curriculum effort, one major innovative effort in the area of media, let's say, one new attempt to provide major instructional programs that go outside the school program, through television perhaps.

And that is about all. That is what your $25 million will buy. Nothing left over for major projects in early education. Nothing left over for major problems of special groups, such as deaf or mentally retarded, or for higher education reform, et cetera.

So one of the most constructive areas of questioning that this committee might wish to pursue with future witnesses is what are the cost estimates that they would put beside objectives for a National Institute of Education. It is all very well and good to wish to reform elementary school programs, to rebuild preschool programs, and provide new systems for computer instruction. But all of these efforts carry expensive price tags and we must decide are we going to finance this operation in such a way that there will be reasonable confidence that such tasks will be carried out.

If the new Office of Management and Budget operates in a similar fashion to the old Bureau of the Budget—and I was able to restrain

my affections for the Bureau of the Budget rather effectively—it can wave its cape and all of a sudden $100 million are going to appear in the budget for a National Institute of Education. Only those in Washington will know it is merely a transfer of existing moneys in the Office of Education budget to a new budget line and that actually no new money is committed at all. It would be a cruel hoax to suggest that $100 million could be used for these new objectives. A large proportion of that money will be continuation of past activities that must be continued or else the Government will again be quite properly accused of more broken promises and commitments.

It will be a surprise to me if more than $20 million of that total figure would really be available to meet some of these new ambitious objectives. Rather than suggest a particular figure for an increase, let me suggest that we systematically place a price tag on each of the proposed activities. There are 15 suggested program elements in the Levien report that has been referred to here. The first one involves an attempt to deal with educationally disadvantaged children. It suggests new curriculum projects, major programs in early childhood education, experimental schools, new measuring instruments, and transmittal of research.

A crude estimate of these costs would be $125 million for the one objective, the first objective. Costs for the 14 other objectives would be worth calculating in a more systematic fashion than I have been able to do.

Now I would like to mention something that is very dear to my heart, and that is the problem of getting the research and development programs into action. One of my concerns about the current bill, as well as the administration plans, is the limited attention paid to the delivery of the finished product to the educational consumer—to the administrator, teacher, and student.

Putting it pragmatically, if you have a new reading program in Phoenix, how do you get it to Indianapolis? There is no educational transportation system to deliver these kinds of goods at the present time. We want to make clear that what we wish to transport is not just information, but complex systems of behavior. It is not just the putting a book in the hands of the teacher. We want to help that teacher learn new systems of teaching, and that means interaction with trained people. It means demonstration, and it means a more intensive effort of training the teacher in the new methods than we have allocated for in the past.

Previous limited efforts of transmitting new programs have been tried through such things as establishing demonstration centers, the design of special centers such as special educational materials network for handicapped, establishment of regional educational labs. One common experience comes back with all these major efforts. We underestimate the cost of change in major education and what is necessary to change. The program change, when it takes place, usually occurs because of some personal relationship that has been formed between the seller and consumer. Unless you have systematic channels of communication involving personal contact, the charges will be difficult to maintain, even if they are started at administrative level. It is hard to find those elements in the new program that are so reward-

ing that it will overcome fears and anxieties raised by departing the educational status quo.

In other words, everybody is for educational change, but educational change is very painful and there has to be some rewards for people who change in order for them to overcome their reluctance to leave the comfortable status quo. So without a specific plan for how to deliver the products of educational research and development, we will continue to have a huge chasm between innovation and implementation.

My strong recommendation would be to have the National Institute of Education become involved in a search for a modern communication system, and, for goodness sake, to budget for it. The cost of this transportation system to build regular communication between developer and consumer is likely to be very large, and there is nothing in the current budgeting or planning that shows that kind of recognition.

The National Center for Educational Communication in the Office of Education, for example, currently carries a budget of less than $10 million, enough perhaps to run an information dissemination system, but not to stimulate major innovations and transportation of new practices. State departments of education, even regional service centers, may have to be involved in such a total program of communication. My concern is not that we have an answer that no one is listening to, but rather we have not come to grips with the issue of communication itself, and that fact will cause much of other efforts of NIE to be less than totally efficient.

There has been much talk about National Institute of Education as being a fulcrum for education reform. An investment of $200 million is not going to reform a $65 billion enterprise. What it can do is become an important catalyst to start needed changes. I applaud the efforts of this committee to stimulate the kind of dialog that has begun this morning.

Thank you, Mr. Chairman.

Mr. BRADEMAS. Thank you very much. Dr. Gallagher. That is a splendid statement, in my view. You have touched, on the basis of your experience in HEW and as a researcher in education, on what seem to me also to be some of the thorniest problems we have to deal with in this area.

I was especially struck by your use of the words governmental amnesia, and that is an experience through which most of us on this committee has passed. I wonder, in that respect, if you could comment on the fate of the regional educational laboratories, because those were authorized by Congress within only the past few years, and yet here we are talking as if they really had not existed in any serious way.

Mr. GALLAGHER. Yes. The educational laboratories were established with great expectations and with ascending cost assumptions. The cutbacks in funds that were well known in 1967, 1968, 1969 caused the very character and nature of the laboratories to change. One of the mandates that the laboratories had in the beginning was that they would play a major communications role to get new ideas into the public school programs as quickly as possible. Some of the laboratories still attempted to do that, but most of them then focused on educational development. They had their staffs cut back. They were under threat

of dismemberment or just being wiped out every 6 months. The morale in these organizations was about as low as you could get.

Under these circumstances, I think it is quite remarkable that they have achieved some of the very tangible products that they have. But I think we should have learned our lesson. Let's support programs that are valid; that we collect the best judgment we can on whether these programs are important to us, and whether we should pursue them, and then fund them for a 5-year basis. Say to an organization, "You have got the funds to do this job; carry through on it." So they won't have to be firing staff, they won't have to be reprograming their activity every 6 months.

You need to have that length of time in order to develop a sound R. & D. product. If you are under the gun every 6 months, it is just difficult, if not impossible, to carry through these responsibilities.

Mr. BRADEMAS. We in Congress, it seems to us have to overcome this slot-machine mentality of putting some money in the educational research bank and expecting instant dividends to return.

Mr. GALLAGHER. I am afraid Professor Moynihan was quite right when he said that if you start from scratch on a major project, it is going to be 5 years or longer. I do have an estimate of delivery time in the table on cost before you get some output. This is kind of our statement of faith in the future of this country in American education. We say we think it is going to be around for a long time and it is going to be important that we have these kinds of products coming out in 1975 and 1976.

The other part of the problem is that with a good delivery system we could be doing a great deal more right now in terms of putting some of these things into operation. We know a great deal more right now than we are doing, as the old farmer used to say. We would be in a position, given a more systematic approach to the delivery of products, to do a great deal more in the schools than we are now doing.

It is not necessary to wait 5 or 6 or 10 years for anything to happen. But if you were going to start from scratch and say: I am going to produce something quite new, I am organizing a staff, I am going to develop a program. I will field test it, demonstrate it and distribute it. Then 5 years is a short period of time to do that.

Mr. BRADEMAS. If I detect any new answer or difference between your statement, Dr. Gallagher, and that of Dr. Moynihan's, it is precisely on that point. And I dare say he would probably not strongly disagree with your point. I am thinking more or less of Mr. Badillo's question. You are in effect saying to Mr. Badillo: "We know more about what they in the Bronx ought to be doing to improve education in those schools than is presently available to your school system, and it isn't available because we have not made the effort of will and committed the money to communicate in usable fashion what we know to the teachers and administrators in your school system."

Is that what you are saying?

Mr. GALLAGHER. Precisely right.

Mr. BRADEMAS. Then it might well be the case that one of the earliest priorities of the proposed new Institute would be to improve the delivery system and communications.

What about the relationship between NIE and the existing regional education laboratories? How do you envisage that developing?

Mr. GALLAGHER. I think the current plans would be to transfer the administration of the educational laboratories and the programs that they are funding to the National Institute and I think that is a very appropriate move. There was a time where the major argument for educational laboratories was that we needed these major institutions to carry out these big projects. And we did. I think the time is pretty well past for just institutional support. I think what needs to be done is to put the laboratories and R. & D. centers under a program support basis. If they can develop in those laboratories or R. & D. centers major programs that are worthy of support, let's support them. But let's not support them merely as institutions.

Mr. BRADEMAS. I am extremely pleased to hear you stress the importance of communications and dissemination, and the implementation of an educational transportation system, which I think is a very useful phrase that I haven't heard before. And I am also pleased to hear you talk about the importance of continuing a commitment of funds and not cutting them off on a stop-and-start basis.

I am pleased, as well, to hear your comments about the importance of a substantial commitment of new money rather than a transferring of existing educational research funds into NIE in order to be able to say, "Look at what we have done." So your statement has been very helpful indeed, Dr. Gallagher.

I would like to call on Mr. Hansen.

Mr. HANSEN. Thank you, Mr. Chairman.

Let me also express my appreciation to you, Dr. Gallagher, for your helpful testimony here this morning. To pursue the discussion on educational laboratory, it would seem to me that perhaps there are some useful lessons to be learned in our experience in the laboratory, where they were set up full-blown perhaps with little reason to know of their validity, and that by looking at that lesson we may perhaps also be a little cautious about moving in full blown with an NIE program in areas where we do not have the kind of an understanding of the validity and the purpose that is essential to its success.

Mr. GALLAGHER. I think your point is well taken. We have learned a great many lessons from the establishment of the centers and laboratories, and that these lessons ought to be put to work in the new National Institute.

The start of these centers was really a major American contribution. There is nothing quite like these before, and they recognize the importance of development, not just the seeking of knowledge for its own sake which always has to be part of the total package, but the translation of knowledge into a meaningful educational program which is much more difficult, much more costly, requiring more diversified staff than we have previously experienced in psychological or sociological research.

So we have found out that to carry out these program development goals it is going to cost a great deal more money, if we are going to meet even a fraction of our objectives. I certainly agree with Professor Moynihan that we are not going to immediately dump four or

five times the amount of money that is now going into OE into a National Institute. But I think the increment has to be fairly high, and I think one of the things that the educational research establishment and funding has provided is the kinds of personnel that can do effective research now. You do have people out there who have the capabilities of doing a good job with funds that could be allocated.

Furthermore, we know that the availability of funds will draw talent. There are many people who are now in the fields of psychology and sociology and economics that might well be drawn into the field of education and educational problems by these additional funds. The buying of the best brains that you can to help the educational system in this country is probably one of the great byproducts of the establishment of a National Institute.

So I would agree that we need to be prudent about how we do this, but it is important for this committee to realize that the amount of funds that are being put in there now have very little relationship to the objectives or dreams that we have as to what kind of problems will be solved with research.

Mr. HANSEN. I would concur with your suggestion with respect to trying to attach a price tag to each of the proposed program elements. But as I understand the Levien report, it did not anticipate all of these coming into being at the same time, but these can be identified as essential elements we should embrace within NIE as it evolves.

Mr. GALLAGHER. That is true. But the pressure on the research establishment and research administrator is very strong, as I well know. The people who will applaud on one hand the fact that you do have a priority in early education will, on the other hand, be dismayed by the fact that that priority prevents you from spending money on other important problems, such as vocational education or education at the elementary school level, for example.

Mr. HANSEN. In order to develop the kind of understanding that will result in continuing commitment and expanding level of support, it is going to be necessary, is it not, that we can demonstrate that this is a workable idea. And as part of the priorities—and I gather this is the import of your comments, with which I agree fully—as part of their priorities, we must perfect and improve the delivery system.

Isn't it important, or is it, to make substantial improvements in the delivery system without a very sizable investment? In other words, by bringing together a lot of what we are doing and developing the machinery that will move what we learn to the place where it can be used. Can't this be done without a large investment? And if we can succeed in this, won't it help build the kind of support necessary to develop these new program elements?

Mr. GALLAGHER. Congressman, I wish I could say yes to that, but I really can't. I think your point, the last point, is an extremely important one. That is, the delivery of the product into use is perhaps the best way to get broad support for these kinds of programs. Because, then, you can have some payoff, you will get greater public support. But I am afraid that the communication system that we are talking about is going to be costly, because we are not just talking about a communication system in terms of delivering information to people. We are talking about delivering of new practices, new methods of be-

having, to the teacher, to the administrator, to the student. And these require very extensive kinds of training and demonstration activity, which are not cheap.

So I would say by investing in a delivery system, you could maximize the payoff of what has already been done; and that is a very important thing to do. But it is not going to carry a small price tag.

Mr. HANSEN. Shouldn't we be trying then, at the outset, to determine what that price tag is, too?

Mr. GALLAGHER. Yes, indeed.

Mr. HANSEN. To me, this is almost the highest priority in this kind of legislation, and I would guess that if we are going to develop within the Congress and within the country the kind of sustained support that I agree is essential for a long-term commitment, we have just got to be able to demonstrate that what we are learning is being put into practical application.

Mr. GALLAGHER. Yes, indeed. You do get into this kind of vicious circle where you say, because you haven't got a communication system, you aren't delivering. Then you can say, well, there is no visible payoff or delivery so we don't feel constrained to give large-scale support.

I think the National Institute could provide a great service by establishing three or four models of communication systems, of putting them into place in regions or States where it would be possible to show how you could get the newest ideas and programs into effect at the earliest possible time. I think there are some models that have already been developed, that I mentioned in the testimony, that would give guidance along these lines.

By doing this kind of thing, we could shorten the gap between the discovery and the implementation.

Mr. HANSEN. Thank you very much.

Mr. BRADEMAS. Following Mr. Hansen's question, is it not fair to say that the emphasis on the transfer of research results into the system, of which Mr. Hansen was speaking, would also afford you valuable resources for learning about substantive research problems?

Mr. GALLAGHER. Yes.

Mr. BRADEMAS. If you are talking about what people ought to be learning, you are likely to learn something on the dissemination end as well as on the receiving end; are you not?

Mr. GALLAGHER. That is right. Communication is a two-way system. We need to have established communication channels to tell us what the consumer needs.

Mr. BRADEMAS. Mr. Hansen and I were in Israel a year ago,[1] and we were both struck by the fact that Israelis seem to make greater use of results of educational research in the United States than we Americans do.

Mrs. Hicks.

Mrs. HICKS. Mr. Gallagher, I feel as my colleagues do, that unless it were going to be able to communicate the material to the consumer, that it is going to be of very little value. Because too often we see research that is just gathering dust on the shelves. So my question to you

[1] See "Education in Israel," report of the Select Subcommittee on Education and Labor, House of Representatives 91st Cong., 2d sess., August 1970; a report of a study mission to Israel chaired by the Honorable John Brademas, Indiana.

would be: How are we going to get a table that will relate the cost to the activities?

And then also, there would have to be some kind of a cost criteria for the communication?

Mr. GALLAGHER. Yes, given some attention to the problem, some cost estimates would not be too hard to come up with. One of the things I was most intrigued with during the 2 years I was Chief of the Bureau of the Handicapped in the Office of Education was this special education material center network. That was established with about 14 centers throughout the country, and their mandate was to get new ideas into the field as quickly as possible, once they are validated. They have since set up 300 associate centers. These are centers at the local level that take responsibility for the actual delivery to the teacher, whereas the centers themselves provide materials to the associate centers.

These associate centers are being paid for out of a wide variety of local funds, out of funds from title III of the Elementary and Secondary Education Act, and title VI of that act. They really show the commitment of the local people to the development of such a delivery system. These are currently restricted just to work with teachers of handicapped children, but I think the lessons that have been learned through that system and through some others that have been tried on a limited basis are available to us. And it would not be too hard to put some reasonable cost figures on those experiences.

Mrs. HICKS. Thank you very much.

Mr. BRADEMAS. Mr. Peyser.

Mr. PEYSER. Dr. Gallagher, I am delighted to hear the concentration on communications, because this is the area I am personally very concerned about. The costs are equally tremendous in this area, and I wanted your reaction to the utilization of some of the top people in the communications field on a voluntary basis, assuming they are available, to develop some basic ground rules on how these areas should be developed.

I can say right now that I have a group of men in this field in New York City who are working in the development of what is going to be a purely communication situation on narcotics or drug abuse education. They are doing this on a purely voluntary basis. If the Government or myself are involved in compensating these people, we would be involved in tremendous expenditures.

Do you believe it is compatible to the national education program to utilize the private sources of communication in a voluntary basis?

Mr. GALLAGHER. Yes; actually I think that is an excellent idea. If you take the concept of a national institute of education and the prestige that such an institute would have, it could bring together the leaders of the communications field and present them with the problems and say: "Look, here is what we need in order to communicate these ideas more effectively. What can you gentlemen provide for us in the way of advice and plan?"

The plan would involve both private and public sectors, I would hope. Again, I want to stress the difference between communication of ideas and materials, and the communication of practices, which are different. Even Sesame Street with its impact—and it has had an impact—isn't going to change the day-care worker in the day-care cen-

ters throughout the country. The children may respond to the program, but the day-care worker probably hasn't improved her skills very much by watching that program.

What we want to do is, not just present new and exciting kinds of experiences to the children, but to strengthen the ability of the person who works face-to-face with the child to do their job more effectively. That is the other side of the communications problem.

Mr. PEYSER. I understand that, and I am hopeful that as we develop and work in this program we are going to utilize private sources, as long as educational areas don't feel a closeout—let's keep it strictly within our own area.

I am delighted to hear your comments on it, because I think there is a great deal of source available for more expenditure.

Mr. BRADEMAS. Dr. Gallagher, I would like to raise one point that Dr. Moynihan alluded to, of which I am reminded by an article that appeared in the Washington Post last week, by Peter Milius, about the difference between rhetoric and action as to the educational program.

I refer specifically to title I of the Elementary and Secondary Education Act, and without objection, I would ask consent that the article to which I refer be inserted in the record.

(The article referred to follows:)

[From the Washington Post, Feb. 15, 1971]

NIXON AND EDUCATION: RECORD AND RHETORIC DON'T MATCH

(By Peter Milius)

President Nixon may be right in saying that the present "wide array of overlapping . . . contradictory" narrow-purpose federal programs in domestic fields is in great need of repair. At the very least, in proposing that these programs be consolidated into broader-purpose block grants to the states, with fewer strings attached, he has hold of a powerful political issue. A subtitle in last month's budget message put that issue succinctly, in big capital letters that no opponent could fail to see or understand. "Revenue Sharing," it proclaimed, "Returning Power to the People."

Yet at least in one domestic field, education, the President's call for reversal of the tide that has made power flow toward Washington contained some ironies. The President is saying now that federal regulations and guidelines ought to be relaxed, on the theory that state and local officials know best how to spend the money at their disposal. Thus he noted that, while current "statutes routinely purport to prohibit federal 'control' of education, they surely impede local control." Yet the Nixon administration, during its first two years in office, has sought not to relax, but rather to tighten regulations governing at least two major federal education programs. And its reasoning has been precisely the opposite of the reasoning advanced last month. Its view has been that, without tighter controls, state and local officials would continue to "waste" federal funds.

In his budget message the President said that, "more than any other federal activity, the school-aid programs of the Office of Education reflect the excesses of the categorical (narrow-purpose) grant system." He noted that the Office of Education now administers "over 100 separate grant programs," and said that "the the maze of set-asides, special conditions, priorities, plans and approvals for these grants is bewildering to states and local school districts alike." Worse, he observed, "Federal aid is often provided for needs and purposes which have already been addressed by state legislation, yet the states are unable to transfer or convert the funds to other purposes that are going unserved."

As his answer to these problems Mr. Nixon announced that he will ask Congress to consolidate these myriad old programs into five new, simpler ones, providing funds for the disadvantaged, for the handicapped, for vocational education, for "schools in areas affected by federal activities" (impact aid), and for "general support" (textbooks, laboratory equipment, other miscellaneous items). This

reform, the President said, would "provide support for educational activities in broad areas where the federal government has developed strong interests . . . over the years." However, he added at the same time "the states would have discretion as to how they would accomplish each of these major purposes." The implication was that they lack such discretion now.

The irony of all this is that the states *already* have great discretion—and that the Nixon administration has been saying for two years that in some fields at least, they ought to have less.

As one example, there is at least one old federal program that already seems exactly to fit Mr. Nixon's new specifications. It is Title I of the 1965 Elementary and Secondary Education Act, at $1.5 billion this year the largest of all OE programs, accounting alone for almost a third of the whole OE budget. The money is distributed to school districts according to how many disadvantaged children they serve. The only requirement is that they spend it only on these children, and as an extra, to help them catch up. All further decisions—as to whether they spend it on teachers or textbooks, reading or math for example—are theirs alone to make.

Title I, like so many of OE's other current programs, is a legacy of the Johnson administration, one of its proudest accomplishments from Great Society days. The trouble with it, as Mr. Nixon himself observed in his education message last March, is that it has "not measurably helped poor children catch up." Proponents say this is because state and local officials have misspent the money, used it in unimaginative ways, spread it too thin, and often spent it on all children rather than just on the poor. Thus for two years the Nixon administration has been doing something the Johnson administration—partly for fear of being accused of encroaching on local prerogatives—failed to do: it has tightened and warned that it will enforce Title I regulations.

One of these regulations (on "comparability") reaches down to the tiniest details of school management, further than the federal government has ever moved before. Its purpose is to make sure that Title I funds are indeed spent on extras for poor children. It requires that local school boards first spread all of their non-Title I money out evenly, local and state money as well as federal, so that services to all pupils in all schools in any one grade are "comparable." The boards may then add their Title I money on top just in poor schools. The comparability rule does not assume that state and local officials are somehow less fallible than federal officials. If anything, it assumes the reverse. The rule, if enforced, will require a major redistribution of resources in many local school districts.

The problem with Title I, and the problem posed by federal revenue-sharing generally, is how to reconcile a federal purpose with local and state control. The Nixon administration has faced the same problem on a smaller scale in the field of vocational education. Federal appropriations for vocational programs used to be pretty much what Mr. Nixon now says he wants—lump-sum grants to the states to spend as they saw fit. In 1968, however, Congress changed that. Its finding was that the states were spending too little money on the segments of the population most in need of vocational training. Its response was to rewrite the law, divide the money up, and require that fixed shares be spent each year on such groups as the poor, the handicapped, and those who had left high school with few marketable skills.

The administration has not yet determined whether to keep or abandon these "set-asides" in the consolidation bill it will send to Congress. Its problem was clearly put in a memo last fall, from presidential assistant John D. Ehrlichman to Health, Education, and Welfare Secretary Elliot L. Richardson. The memo, intended to elicit policy proposals in the vocational field, contained six questions. One was, "How can federal vocational education programs best serve as a catalyst for reform in the often moribund state vocational educational agency without violating the principles of the New Federalism?"

Mr. Nixon declared once before, in his education message to Congress last March, that "I am determined to see to it that the flow of power in education goes toward, and not away from, the local community. The diversity and freedom of education in this nation, founded on local administration and state responsibility must prevail." Yet the President also said, in that same message, that he was not going to seek "major new expenditures" for education until, as he put it, "we gain a new confidence that our education dollars are being wisely invested to bring back their highest return in social benefits, and . . . provide some assurance that those funds contribute toward fundamental reform."

How to reform and not interfere? That is the question.

Mr. Nixon said in his State of the Union message last month that "I reject the patronizing idea that government in Washington is inevitably more wise, more honest and more efficient than government at the local or state level . . . The idea that a bureaucratic elite in Washington knows best what is best for people everywhere and that you cannot trust local government is really a contention that you cannot trust people to govern themselves." That is the politics of his proposal. It is also an oversimplification.

When the President's bill is sent to Congress, it will have strings attached to funds; his own Commissioner of Education said as much last week. Meanwhile, it is enough to say that the President's rhetoric and his record do not match.

Mr. BRADEMAS. The point of Mr. Milius' article was twofold:

First, title I ESEA funds have not been expended as Congress intended; namely, directed toward those school districts in which there are large numbers of poor children. But second, we are then told that the expenditures of title I are not producing the results for which they are intended—improving the education of children in such districts. And people then say we don't know enough about what really works in education!

It seems to me that what Mr. Milius is describing is really not intellectually honest; for if Congress says, spend the money on oranges and the money is then expended on apples, we must not then be told, you know money spent on oranges doesn't work. Yet that in essence is what has been going on in this country. We don't have time at this point to go into it, but I think the instance I have just cited is one which those of us concerned about honest educational research ought to have in mind. For otherwise, it will be contended that we ought not adequately to fund certain ongoing educational programs which may very well be more productive than would, given the facts I have described, appear.

Have I made my point clearly?

Mr. GALLAGHER. You certainly have, and one could talk about Head Start in a similar vein. And I think the wisdom that this committee has shown in its considerations on day care could be mentioned here in terms of saying that, if we dole out the money in the same fashion in a new effort on day care, without providing the support services that allow us to train personnel or allow us to have research and development, or to have the communication system we are talking about, we run the risk of the same kind of problem.

Any program that we now introduce has to have these kinds of support elements in them. Because we have learned from title I and Head Start, and from some of our other experiences, that unless those support forces are put into place, the persons on the firing line are not going to be able to do the job that they can.

It is like complaining about the infantryman when you don't have a logistic system to get his needed equipment to him. You can't blame him for not operating as effectively as he might. We have a very sophisticated concept of a supply system for the military. What we don't have is a sophisticated concept of a supply system of new ideas and effective services for education. And I would hope that the National Institute would be a catalyst in considering such a system.

Mr. BRADEMAS. Thank you very much indeed, Dr. Gallagher. You, too, have been enormously helpful to our subcommittee on our first day of hearings, and we are grateful to you for having come.

The Chair has observed earlier that we would be continuing hearings on this bill next Tuesday and Wednesday, but he has been advised that there will be a Democratic caucus on Tuesday morning and this may therefore mean that we will have to put our witnesses scheduled for Tuesday morning off until probably Wednesday afternoon, because we already have witnesses scheduled for Wednesday morning. The Chair makes that observation for the benefit of those who plan to be following this bill.

Thank you very much.

The subcommittee is adjourned.

(Whereupon, at 12:30 a.m. the subcommittee adjourned, to reconvene Wednesday morning, February 24, 1971.)

TO ESTABLISH A NATIONAL INSTITUTE OF EDUCATION

WEDNESDAY, FEBRUARY 24, 1971

HOUSE OF REPRESENTATIVES,
SELECT SUBCOMMITTEE ON EDUCATION
OF THE COMMITTEE ON EDUCATION AND LABOR,
Washington, D.C.

The Select Subcommittee on Education met at 9:45 a.m., in room 2257, Rayburn House Office Building, Hon. John Brademas (chairman of the Select Subcommittee) presiding.

Present: Representatives Brademas, Quie, Reid, Landgrebe, Kemp, and Peyser.

Staff members present: Jack Duncan, counsel; Martin LaVor, minority legislative associate; David Lloyd-Jones, professional staff member, and Gladys Walker, clerk.

Mr. BRADEMAS. The Select Subcommittee on Education will come to order for the purpose of further consideration of H.R. 33 and related bills to establish a National Institute of Education.

The Chair would observe, for those who were not present at our opening hearings, that the purpose of the bill under consideration is to implement the proposal of the President in his March 3, 1970, address on educational reform to establish an Institute of Education in the Department of Health, Education, and Welfare, to serve as a focal point for research, demonstration, experimentation across the board in American education.

We are very pleased today to have three distinguished authorities on American education to testify further on this bill. The Chair hopes that perhaps the three witnesses would be willing to allow us to insert as if read the entire text of their statements, and perhaps if they would summarize their major points, this would enable the members of the subcommittee to put more questions to them.

We are pleased to call as our first witness Dr. Stephen K. Bailey, the chairman, Policy Institute, Syracuse University Research Corp., and a widely recognized authority on the administration of Federal education programs and, the Chair is pleased to say, an old friend.

Dr. Bailey, we are very pleased to hear from you, sir.

STATEMENT OF DR. STEPHEN K. BAILEY, CHAIRMAN, SYRACUSE UNIVERSITY RESEARCH CORP., AND SECRETARY-TREASURER, NATIONAL ACADEMY OF EDUCATION

Dr. BAILEY. Mr. Chairman, I will be as brief as I can. You have a prepared statement which I sent down last week. I would like to call to your attention and to the attention of the committee particularly the remarks that I have on pages 3, 4, and 5.

(The document referred to follows:)

PREPARED STATEMENT OF STEPHEN K. BAILEY, CHAIRMAN, POLICY INSTITUTE, SYRACUSE UNIVERSITY RESEARCH CORP.

Mr. Chairman, distinguished members of the committee, I am grateful for this opportunity to testify before this distinguished committee on a bill as important as H.R. 33. Faced, as you constantly are, with hundreds of bills that are modest at best in import; or with a few major bills that involve the expenditure of billions of dollars, it must be a particular delight to work on a piece of legislation such as this. H.R. 33, as I am sure this committee is well aware, can have extraordinarily beneficial effects upon the entire citizenry, especially the young, and at reasonably modest costs. And if implemented with wisdom and verve, H.R. 33 could, over time, make it possible to discover most efficient ways of purveying educational services to the American people—thereby showing down the galloping costs of schools, colleges, and universities.

The principle behind H.R. 33 is almost ridiculously simple. It is that if a man will focus his skills, reason, and humaneness upon his problems, he can markedly improve his condition.

We know what this principle has done for American agriculture. When Khrushchev visited the United States in the late 1950's, it was the miracle of American agriculture, not this country's industrial prowess, that made the deepest impression. And American agricultural productivity is in turn a product, in large measure, of the experiment stations and the county-agent system that emerged in the last decades of the 19th century, and the early decades of the 20th century. The whole land-grant philosophy of establishing agricultural institutions devoted to the discovery and dissemination of practical knowledge is perhaps the root idea undergirding H.R. 33.

Another analogous example is, of course, to be found in the field of medical research. The fact that we are a relatively healthy people in spite of the inequities and shortcomings of our health delivery services is a tribute to publicly and privately supported medical research over the past several decades.

As I understand H.R. 33, it calls for the establishment of a National Institute of Education that would attempt to do for the improvement of education what other similarly conceived institutions have done in the past for the improvement of agriculture and of health.

It is, of course, a fair question as to why federally-funded educational R. & D.—especially under Title IV of ESEA—has not already produced more dramatic improvements in American educational practice over the past half-decade. This committee is well aware that a number of R. & D. Centers and Educational Laboratories were created under the Cooperative Research Act of 1954 and as amended by Title IV of ESEA of 1965. Furthermore, something like $30 to $40 million a year under that title have been available over the past half-decade to individual scholars or to groups of scholars, most of them university based, for educational research undertakings of their own definition.

I do not wish to denigrate the work that has been done. Some extraordinarily significant findings have emerged and we are just now beginning to see some of their practical implications.

But I would submit that the inability of federally-funded educational R & D activities to make a really significant dent on American educational practices has been due to three elemental factors:

First, the level of funding has been impossibly inadequate;

Second, the federally imposed patterns of R & D structure and funding have been the enemies of coherent research, development, and diffusion strategies;

Third, the inherent complexity of educational R & D and the diffuse (almost atomized) nature of educational governance in the United States precludes revolutionary and universally accepted breakthroughs in short periods of time.

Let me say a word or two about each of these, for it is my belief that unless the Congress and the Executive Branch, in the process of developing and implementing H.R. 33, remedy these defects, little will happen in the field of educational R & D that will make any substantial difference.

First, as to levels of funding. Roger Levien in his masterful analysis of the NIE idea has noted that in 1968 total federal expenditures for educational R & D were less than 1/10th those for R & D in health and only a fifth of the amount spent for agricultural R & D (See page 36 of the December 15, 1970 draft of "National Institute of Education, Preliminary Plan for the Proposed Institute").

the areas of educational R & D in which I have had some fairly specific invoi. ment, the Regional Educational Laboratories, I can only comment that the

amount that has been appropriated each year for the past five years has not only dwindled, it was totally inadequate to begin with. I would remind this committee that when President Johnson wrote a letter to the Secretary of HEW, John Gardner, on July 5, 1966 on the occasion of the opening of the first ten Regional Educational Laboratories, he said in part, "The laboratories should be large and significant enterprises, equal in size and scope to the major tasks they seek to accomplish. They ought to be conceived as comparable in their way to the large-scale laboratories of the defense or the atomic energy establishments. Nothing less will do. Their missions are equally important."

Certainly at the heart of President Johnson's eloquence was his knowledge that only with substantial and sustained funds could educational R & D attract from fields other than traditional educational research the kinds of rich and diverse talents needed in concert to remedy the short-comings of our existing educational system. President Johnson's wise words were not followed. Instead the brave beginnings made by the original 20 regional laboratories were not given adequate financial nourishment. Five labs were killed in 1969. Four more are being killed this year.

May I make the strongest possible plea that NIE not become another International Education Act—that you do everything possible to convince the relevant members of the appropriations committees of the Congress to appropriate a minimum of $250 million for NIE the very first year. In my estimation this amount should rise each year thereafter until some kind of parity is reached with expenditures for R & D in the field of health.

Second, the federally funded educational R & D activities of the past few years have in my estimation, lacked adequate focus and continuity. In retrospect, I think it was a mistake to have created a Bureau of Research in the U.S. Office of Education during the reorganization of 1965. This bureau never had the clout of either hierarchical status or of S & E budgets to impose any meaningful coordination upon the research functions of the other line-operating bureaus of the Office. And whatever the original reasons for setting up relatively autonomous structures for the Regional Educational Laboratories, the realities of decremental budgeting meant that an inadequately supported bureau of research in USOE had to assume the melancholy task of second-guessing regional laboratory decisions and priorities—making a mockery out of "regional control". The final blow to efficient R & D management was the unpredictability of year-by-year congressional funding—both as to amounts and as to timing.

My belief is that the NIE structure as proposed in H.R. 33, and as explicated by Roger Levien, would overcome all of the above problems except for those associated with Congressional appropriations. On the latter, I can only plead with you and with your colleagues to adopt for educational R & D some of the multi-year and no-year funding arrangements that have proved so successful in the budgets of AEC, NASA, and DOD.

Finally, let me say a word about the complexity of educational R & D, and the need for Congressional faith and patience. I once worked on the Hill as an AA to a Senator. I know a little about the political need for "show and tell". I referred earlier to agriculture and to medicine. Difficult and complex as these fields are, they are relatively simple compared to the field of education. And they were given federal funds for decades before any dramatic breakthroughs occurred.

American education is going through pains of growth and adjustment that are almost seismic in effect. For generations schools were sorting devices even more than they were educating devices. Restless and non-bookish kids were expected to drop out so that the virtually insatiable demand of our economy for unskilled labor could be satisfied.

Today, alas, if one is unskilled he is likely to be unemployed. We are trying to give advance instruction to types that in previous generations would have been working on the railroad at age 15. High schools and colleges used to be for the elite of the middle and upper classes. Today a high school diploma is a virtual necessity for everyone, and some kind of post-secondary education is becoming essential for an increasing majority.

In the face of all this, we are coming to such sobering conclusions as the fact that we simply do not know how to teach poor kids. We really do not know why Johnny can't read: is it because of his mother's diet during the pre-natal period; is it because of inadequate parental play in the early months of life; is it because of "cultural deprivations" in the home—whatever that slippery term means; is it because of the self-fulfilling prophecies of teachers who believed that Johnny was stupid; is it because of poor instruction; is it because of a

low self-image reinforced by failure in terms of middle class grading norms; is it because of some ineffable combination of all of these factors?

And today, if a single teacher in a ghetto school is able to demonstrate that she can succeed in spite of all these questions, how can what she has, or what she is, be bottled for shipment to the tens of thousands of other schools in this country?

I use this as an example only. To solve the reading problem in this nation may take twenty years of R & D with steady and sufficient funds paid out to interdisciplinary teams made up of biochemists, brain physiologists, nutritionists, psychologists, media experts, engineers, "Fuller-brush"-type salesmen, economists, political scientists, school administrators, and teachers.

One of the great functions of NIE could be to organize and to fund such teams. But this will happen only if the steadfastness of Congressional support is assured over a long period of time.

Let me close by asking what happens if NIE or something like it is not created and adequately funded over time? All of us can make some predictions. We will not get the poor out of poverty; we will continue to spend increasing billions of dollars a year of the taxpayers money for inflated educational costs without any real change in the quality of educational output. We will have consigned millions of human beings to underutilized or totally inutile lives.

Some years ago H. G. Wells summed up the entire issue. In an obscure novel called *The New Machiavelli*, Wells had this to say, "If humanity cannot develop an education far beyond anything that is now provided, if it cannot collectively invent devices and solve problems on a much richer and broader scale than it does at the present time. it cannot hope to achieve any very much finer order or any more general happiness than it now enjoys."

Biography of Stephen Kemp Bailey

Stephen K. Bailey is Chairman of the Policy Institute of the Syracuse University Research Corporation and Maxwell Professor of Political Science in the Maxwell Graduate School of Citizenship and Public Affairs of Syracuse University. Dr. Bailey was formerly Dean of the Maxwell School. He was a Rhodes Scholar from 1937 to 1939 and received both a B.A. and an M.A. from Oxford University. He also holds an M.A. and Ph. D. from Harvard University. Before joining the Maxwell School in 1959 as Professor of Political Science, Dean Bailey served on the faculties of Hiram College, Wesleyan University, and Princeton University. At Princeton he was William Church Osborn Professor of Public Affairs and Director of the Graduate Program in the Woodrow Wilson School of Public and International Affairs. He has also been a Fulbright Lecturer in American Government at Oxford University.

Dr. Bailey is currently Secretary-Treasurer of the National Academy of Education and is a past President of the American Society for Public Administration, and a past Vice-President of the American Political Science Association.

Dr. Bailey is also active in public affairs. He is currently a member of the Board of Regents of the State of New York and Chairman of the National Advisory Committee on Educational Laboratories (Department of HEW). In 1964 he was a member of the Presidential Task Force on Government Reorganization, and in 1965 he headed the U.S. Bureau of the Budget Task Force on Intergovernmental Program Coordination. He has served as a Staff Associate to Task Force No. 1 on the Presidency by the First Hoover Commission. Later he became Director of Task Force No. 1 on the Executive branch for the Connecticut Commission on State Government Organization. Dr. Bailey was Chairman of the Connecticut Democratic State Platform Committee in 1950 and in 1951 became Administrative Assistant to Senator William Benton of Connecticut. He was elected Mayor of Middletown, Connecticut in 1952.

Dr. Bailey is the author of many books and articles on politics, government, and education including *Congress Makes a Law*, 1950, winner of the Woodrow Wilson prize of the American Political Science Association; *The New Congress*, 1966. His most recent book (co-authored by Edith K. Mosher is *ESEA: The Office of Education Administers a Law, 1968*. Among his articles and monographs are, "The Condition of Our National Political Parties," 1959; "Ethics and the Politician," 1960; and "The Office of Education and The Education Act of 1965," 1966. He is co-author of *Congress at Work*, 1952; *Government in America*, 1957; *Schoolmen and Politics*, 1962; and *The Problems and Promises of American Democracy*, 1965.

Dr. BAILEY. Essentially what I tried to do in the testimony is to review why it is that educational R. & D. has not produced more specific and dramatic results and to compare it in the sense with what has gone on in the field of agricultural experimentations for 100 years and in the field of health research for a number of decades.

I tried to suggest that, looking back over the past half decade, there have been three major problems in the education R. & D. field as I have observed it.

First, the level of funding has been impossibly inadequate for the laboratories and R. & D. centers and for sponsored research under the Cooperative Research Act of 1954.

Second, the way in which research and development in education is structured in the Federal Government has been very cumbersome, and the funding patterns of Congress have been so unpredictable and intermittent, that it has been very difficult to make sense out of the program.

Third, the complexity of educational R. & D. and the diffused and atomized nature of educational governance in the United States makes it very difficult—even if you had dramatic breakthroughs in educational research findings—to get new practices diffused and adopted by the 17,000 school districts and 150,000 schools in this country.

In short, I am pleading that this committee take seriously what has hampered the development of educational R. & D. to date, and to push—through the creation of the NIE—for a new level of funding, a new kind of structure, and a new emphasis upon diffusion of educational innovations.

On the funding side, I can only say that this kind of bill, which I think could be extraordinarily important to the entire society, really is not going to get anywhere unless the Congress and President are willing to start at a level of something like a quarter of a billion dollars a year.

I have spent, as you know, some time as Chairman of the National Advisory Committee on Educational Laboratories for HEW, and year after year I saw the original inadequate amount of money for the laboratories dwindle each year.

That, combined with the unpredictability of the funding, meant that the work done in the laboratories, and there has been some very exciting work done in the laboratories, simply has not been able to pay off in terms of dramatic educational results.

If anybody tried to calculate a way to destroying the morale of research institutions, it would be hard to think of a better way to do it than the way in which R. & D. centers and laboratories have been handled in the last 6 years.

Mr. Chariman, I think that is enough for a beginning. You have my paper before you. I will be glad to respond to any questions I can.

Mr. BRADEMAS. Thank you very much, Dr. Bailey. Last week on the first day of hearings, Dr. James Gallagher who was in charge of research in education in HEW for a time, suggested that a good deal of quality research in education already exists and that what is required is more attention to the dissemination of the results of that research.

This was somewhat at odds with the earlier testimony of Dr. Moynihan, who had suggested that we don't know enough about the learning process and he did not put as much attention to the question of dissemination.

Could you give us your judgment on this particular matter, if I have articulated it adequately?

Dr. BAILEY. Mr. Chairman, I can only guess at the assumptions of the two gentlemen you refer to. If you begin with each one of their assumptions, they are both right. Surely there are some lessons we have learned in the field of educational research and I call respectfully to the attention of the committee some of the breakthroughs, for example, in first year communications skills out of the Southwest Regional Laboratory, the work in bilingualism of the Austin, Tex., Laboratory, the work on individually prescribed instructions that was developed particularly in the Pittsburgh R. & D. center and then carried on by Research in Better Schools in Philadelphia.

These are some of the kinds of breakthroughs that I think are exploitable, where additional money for diffusion would make an enormous amount of difference.

However, I must say that I have to agree with Mr. Moynihan when you are talking about some of the most fundamental questions of American education like the question of reading, and particularly the question of the teaching of reading to, if you want, the poor.

I simply have to agree with him that we don't know how to teach poor kids, and if one begins to ask, what would be necessary in order to make sense out of the reading skill problem, I have to refer you to page 6, last paragraph in my testimony when I simply say that: We really do not know why Johnny can't read. Is it because of his mother's diet during the prenatal period? Is it because of inadequate parental play in the early months of life?

Is it because of cultural deprivations in the home, whatever that slippery term means. Is it because of the self-fulfilling processes of teachers who believed that Johnny was stupid?

Is it because of poor instruction? Is it because of a low self-image reinforced by failure in terms of middle class grading norms? Is it because of some inevitable combination of all these factors?

And I simply go on to say that solving the reading problem in this fashion may take 20 years of R. & D., with study and sufficient funds paid out to teams made up of biochemists, the brain physiologists, nutritionists, psychologists, Fuller Brush salesmen, economists, political scientists, and teachers.

In this sense, there is an awfully lot we simply do not know about the learning process and the neurological and physiological conditions of learning.

Mr. BRADEMAS. You touched, Dr. Bailey, on the problem of the unpredictability of congressional funding as being one of the principal culprits that have caused the weakening of the regional laboratory concept.

And then you just referred to a partciular problem in education; namely, that we don't know enough about how to teach poor children to read.

It would seem to me that there are clear implications in both of those observations of yours with respect to the NIE and the importance of greater support for research.

To put my question in a somewhat rhetorical way, how can we help—if this is your hypothesis—how can we help Members of Congress and the public generally realize that expenditures on educational re-

search may be the principal way to bring about change in the educational system which will lead both to better education substantially and greater return on the investment of their tax dollars?

In other words, to use your phrase here, "the political need to show and tell", how can we get that across to our colleagues in Congress, especially on the Appropriations Committee, who may not appreciate that linkage?

Dr. BAILEY. Mr. Chairman, I would hesitate to bring this kind of advice to you of all people but to this committee generally I can only comment that I did once work on the Hill and I know a little bit about the political problems that are involved.

You people are elected for 2-year terms, the Senate for six, and the President for four, and there is an enormous compulsion to "get something done."

The fact of the matter in retrospect was that an awfully lot was done in the field of agricultural research development, even though it was 40 or 50 years after the Morrill Act and its supplemental enabling legislation, that we began to get real pay offs in terms of agricultural productivity.

I think there has just got to be an understanding on the part of Congress that we are dealing in the field of education with a phenomenon that is unbelievably complex. Even the definition of what we mean by the term is difficult. It is a field that involves multiple goals. It is a field that has a lot of encrusted tradition.

It is a field that in governmental terms is bottom heavy in the sense that a lot of decisions are made locally and I think for many reasons should be. But all of this means that an enormous amount of steadfastness and patience has got to be manifest by the Congress of the United States and the executive branch looking ahead to years of prior investment before very dramatic breakthroughs will take place.

Mr. BRADEMAS. I will ask you one other question, Dr. Bailey. You have written on the administration and implementation of the Elementary and Secondary Education Act and how the Office of Education responded to it.

I am going to put a question to you that I in all candor would like to raise much later on in our hearings, but, because you are here today, we will take advantage of your presence. What comments can you give us on the relationship between the National Institute of Education and the Office of Education in NIE?

Do you have any general observations on that? I know this is something that is much on the mind of the men and women who inhabit the Office of Education and those who might have in mind some day being in the NIE.

Dr. BAILEY. Mr. Chairman, could I back into that response by indicating first of all and this certainly is premature, that I am not very happy about the President's recommendation for a gigantic Department of Human Resources.

It seems to me that what is needed if we are going to give real priority to the field of education is to upgrade the level of education in the Federal structure. This leads me to a position which many Congressmen and Senators have already taken, notably Senator Ribicoff on

the Senate side, that there ought to be a separate department of education at the Cabinet level.

But within the existing structure I would be reluctant to see the projected NIE structurally a part of the U.S. Office of Education, even though I will be quite happy to see the National Institute of Education directly accountable to the Commissioner of Education, if I may make that distinction.

I say that because in my testimony I refer to what seems to me to have been a mistake in the reorganization of USOE in 1965 in setting up a bureau of research which was essentially at the same level with other operating bureaus, when in fact the research function not only needs to have a kind of eagle's eye view of all of USOE, but also of a great deal that is outside of USOE.

I referred earlier in my testimony to physiological and neurological research that may be quite relevant to the capacity of a child to read.

It is quite possible that this ought to go on in NIH or NIMH and be supported that way. It is conceivable that some of the work that will go on in day-care centers that is educational in nature should take place not under USOE but under the welfare administration.

So I see the need for a kind of high level for the research function in order to give it the, if you want, bureaucratic status and the clout in terms of supergrades that will be necessary to look throughout the Federal structure and beyond and try to do a really imaginative coordinating job.

I think it will be very difficult to mount that kind of status and to justify the exemptions from Civil Service Act and other privileges of the kind that NSF has now if you simply put this structurally within the existing matrix of the U.S. Office of Education.

Mr. BRADEMAS. Thank you. That is very helpful. Mr. Peyser.

Mr. PEYSER. Dr. Bailey, thank you for being here with us. I spent a good deal of my college career battling Syracuse. I went to Colgate. We were one of the old rivalries in the State of New York but that is not the case this morning.

I do have a question that I would like to ask.

One of the problems I feel is the many changes in educational philosophy that come down from the educational experts over the years.

As soon as schools start implementing one philosophy, another philosophy is being developed and the old one drops out, and the public and Congress could get reluctant to get into new massive programs if they don't see what has happened to previous ones.

You mentioned 20 years here as a time that it may take. Isn't it possible that could be realistically put down to a much quicker area when we are talking about in terms of developing reading, which is one of the basic things, because I think if we are going to talk about 20 years to reach a solution, the feeling is apt to be, and I might have it, by the time we reached 10 or 12 years what we were talking about in the first 3 or 4 has already been dropped and the program does not seem to move forward.

Isn't it possible to say that after a 5-year solid commitment if we used a quarter of a billion dollars a year as a figure, we could see a positive stride in the area of reading?

Dr. BAILEY. Congressman Peyser, I am sensitive to the question you raise here.

My 20-year figure really is based upon perhaps an inadequate but nonetheless sincere appraisal of how complex the world of reading is. This does not mean that some very important breakthroughs might not develop within 2 years, 5 years, or 8 years.

But I think we have got to be prepared to spend as much time, effort, and energy on accomplishing the reading goal as we have on reaching the moon or on cancer.

Cancer may be a good analogy here because we have not yet conquered cancer. But we have made enormous progress and the progress has come because of the investment of both private and public funds, public funds that have been doubled in the last decades.

It seems to me if we could look at the reading problem much as we look at the cancer problem, by putting resources and energy and imagination into a 20-year goal, with the understanding hopefully that very helpful breakthroughs would come through for certain parts of the problem far short of that time, that this might be a way of looking at it that will be helpful.

For example, the work that is being done in bilingualism in the Austin laboratories in Texas. Surely this is already having some payoffs. Mexican-Americans and Indians and others who are taking advantage of this bilingual program are certainly doing better than they were doing before the program started.

But this is a long way from meeting the kinds of problems which I see as a member of the board of regents in the State of New York, where in the city of New York roughly 46 percent of the young people at sixth grade level are below minimum standards of competence in reading by at least a year and a half or 2 years.

This is a frightening statistic. I think that the problem is that complex so we ought to at least be willing to think about 20 years, even though successful breakthroughs may come in a shorter period.

Is this responsive to your question?

Mr. PEYSER. Yes, it is. My feeling is from making Congress move on this that I would like to think of less than 20 years to produce that kind of response. One other quick question. That is, you make a reference to cutting the galloping cost in education by NIE.

Would you comment on what you mean by that? I would be delighted to see how you propose doing that. How do you feel NIE specifically would result in that area?

Dr. BAILEY. I am sure Colgate is beautifully administered at the moment. I have great respect for Mr. Bartlett but the fact of the matter is that some institutions of higher education are miserably managed.

I think some money spent by an organization like National Institute for Education on the question of economies of scale, regionalization of higher educational organization, experiments with external degree opportunities where you bring education out to the boondocks rather than having to bring everybody into a single campus, the sharing of computer facilities, the rationalization of library collections so everybody does not try to duplicate each other's holdings.

These are some of the kinds of the kinds of activities that could be sponsored by a National Institute of Education which ultimately could decrease the existing cost of education.

Mr. PEYSER. Thank you.

Mr. BRADEMAS. Mr. Quie, do you have any questions?

Mr. QUIE. No, Mr. Chairman.

Mr. BRADEMAS. Mr. Kemp?

Mr. KEMP. Thank you, Mr. Chairman. I have a couple of questions. I too would like to thank Dr. Bailey. I wonder if you might identify for us some of the specific areas which you think NIE would direct research efforts toward?

Dr. BAILEY. Congressman, all I can do really is to share with you my own philosophical biases about where I think the major problems are that need really serious attention.

I refer back to an earlier statement I made. I don't think we know at the moment in this country how to teach poor kids.

I don't think you can take middle-class teachers with middle-class backgrounds using middle-class materials and put them into subcultures they don't understand and expect them to get through. So one of the priorities that I would see for the National Institue of Educaion would be if you want the field of poverty, how you teach the poor, how you get through to the people in the central cities, and may I say in to the rural areas.

Everybody talks about urban education problems. I am concerned really with education deprivation no matter where it is and there is a lot of it in the rural sections of the country that need quite as much attention as issues in the cities.

So this would be one area. A second area of research, and, of course, it is tied in but it is cutting the pie a different way, is the area of reading and mathematical skills and the whole area of socialization, that is. social studies and what is referred to as the effective side of learning.

I think an enormous amount of research needs to go on as to ho v we do those jobs better both in order to make it possible for people as they grow up to enter into the labor market with some skills and to enter into the policy with some notions of what citizenship means.

We have a long way to go there. I think we need an enormous amount of research into both the finance and structure of education in this country.

I am perhaps peculiarly conscious of this at the moment because of my position on the Board of Regents of New York but I know we are hurting in the field of finance and there are all kinds of research activities of a modest character going on presently on tax assumptions for education, on ways of allocating money for education to equalize opportunities and equalize financial burdens.

We still are just scratching the surface of this entire area and it has real meaning for the whole future of federalism. For example, what roles ought the Federal Government, the States, and the local school districts play?

I think we should do more research in the field of work-study opportunities in this country. My own diagnosis of secondary schools is that we have just a massive number of bored human beings in our secondary schools and we can understand this is part because of things like the revolution in communications.

If somebody is looking at Jacques Costeau on Sunday night and goes on the next morning to a 50-minute session with a person who has taught biology 1 for a number of years, it is no wonder a number of the kids are turned off.

It is a question of how we use new media, new work-study operations, using the city as classroom or the environment as classroom. All of these come to mind. This is off the top of my head but these are the kinds of areas where an NIE could make an enormous differance over a period of time by focusing attention and research energies.

Mr. KEMP. Dr. Bailey, you have written extensively on regional labs. How do you see their relationship with NIE for the future?

Dr. BAILEY. I would assume that the regional laboratories in some form or other would continue and that part of the NIE responsibility would be to coordinate the activities of the separate laboratories and be the major administrative funding act for research carried on by the individual labs. The labs would then, like R. & D. centers, be places, if you want, retaining research activities.

The NIE itself, I think, would have to have some inhouse research. But its greatest functions would be to try to rationalize and bring greater cohesion to what is going on in universities and in R. & D. centers, and to provide some kind of incentives for far greater diffusion activities than the labs have been abl to conduct to date.

Mr. KEMP. Thank you.

Mr. BRADEMAS. Mr. Reid.

Mr. REID. First, Dr. Bailey, let me welcome you here most warmly. I am delighted you can be here representing both the board of regents and Syracuse University Research Corp.

Let me ask a few general questions. I take it that you would subscribe to the proposition that we need to put much greater emphasis and resources into preschool combined with nutrition and health which is part of separate legislation that the Chairman and I are working on combining national day-care centers and probably Head Start.

But the first 4 years of a child's life may be the key to the learning process. One of the deficiencies is lack of emphasis on preschool.

Would your research confirm that?

Dr. BAILEY. As to my first priority, how do you teach poor kids, again I don't think you can answer that question unless we zero in on preschool years.

It may have to do with prenatal diet, with diet of young people, with day-care center activity, with operation Head Start, the kinds of things with bilingual activities before school such as is being carried on now in the Austin laboratory, Ben Bloom's work seems to me as well as the work of Piaget, seem to me to add up to a very strong emphasis on the preschool years as the key to later learning and later self-sufficiency in the educational world.

Mr. REID. What do you think you learned or did not know or suspicions you had confirmed through the regional educational laboratories?

What kind of research should be initiated at the Federal level in this institute?

Dr. BAILEY. I think we have learned some things both positive and negative. Positively there are a lot of things going on in the laboratory now that are very exciting, and the payoff, I think, are nearby. With a real diffusion effort you could take some of the things that have been developed and make a difference in a large part of the Nation's education.

I think, on the negative side that if the laboratories were starting over again, were adequately funded, and I have to underscore that, I think they might well have brought a lot more scholarship from different areas of expertise. That is, they might have defined tasks in such a way that they could have brought task forces together upon which would sit physiologists, nutritionists, child experts, reading experts and so on.

I think there has been a slight tendency in the laboratory to put too much weight on the reasonably thin resources of education with a capital E.

I think the trick in the field of educational R. & D. is to do for this field what was so magnificiently successful in the moon shot which is to identify goals and then to pull together talent from a dozen or a hundred different professions and focus that talent upon specific problems.

Mr. REID. I am sure that makes great sense and in a way you are talking about funding and methodology. Let me go behind that to one or two concepts. You talked about students being bored, you talked about structure, we have talked a little bit about the preschool area. What are your thoughts about compensatory education, what are your thoughts about the children, 7 million of them, who come from homes where they don't have two parents, and in some cases don't have one parent? What do you think are some of the things that we should be testing in this research area that would make education more relevant, that would bring children along in a more hopeful way?

What are some of the guideposts and hopeful signs that you have taken—that you have seen to reach the child? What would you guess, and I am asking you to speculate, are some of the things we are doing badly? For example, Sesame Street obviously seems to be striking a fairly responsive chord.

It is quite clear if you look at our classrooms across New York State and indeed across the country that many children are falling behind at many grade levels, never to catch up.

What are some of the major things we should be thinking about and some of the things that should be broken out in a surge that would help?

Dr. BAILEY. Congressman, this is a bigger question than I am sure I can handle in this setting. It needs enormous thought and I would hope that an NIE function would be to address itself to the question you have raised.

It is hard to think of a more important one. I can make one or two quick comments and that is all. First. the Southwest Regional Laboratory in Englewood, Calif., has as you probably know put together what they call a first year communication skills program which they have addressed particularly to minority groups in the Los Angeles area.

I would commend this program to this committee. I have some information here about it and you can get further information from the U.S. Office of Education. But what they are doing seems to me to be very hopeful.

They are taking a problem like the reading problem and breaking it down into modular units, developing kits of teaching materials, ways of learning, ways of training leaders, ways of tutoring tutors, and this

is a program which, if substantial funds are behind it, I think would make a difference in our State as well as others.

I would like to see further emphasis upon that kind of approach to the early years in the field of compensatory education.

I think it very possible that we may have to move in the next few years to some kind of voucher system and I mean this not in the sense Sandy Jencks and others at Harvard have been using it, but a way of saying to parents, if the existing school system leaves your child behind, then here is a voucher that will enable you to take that child for certain periods of the day and put that child in the hands of specialists in the areas of his deficiency, and I think some kind of movement of that sort may be necessary.

I can't speculate on how that would look in detail but I think it intolerable to leave the children of our State, let alone the other States of the Union, in the condition they are left in with 25 percent of the kids in the cities and 46 percent in New York City for below grade level.

I don't speak, incidentally, Mr. Congressman, for the board of regents. I am simply identifying that as a reason for my concern. They speak for themselves in an august way. I am deeply concerned with the problems which are presented to us monthly of the kind we are just discussing.

Mr. REID. Thank you very much. That is very helpful.

Mr. BRADEMAS. Mr. Landgrebe.

Mr. LANDGREBE. Dr. Bailey, I want to pose a question that I asked the other day. We talk about teaching methods and the lack of interest of the students. Do you conceive this new Institute perhaps addressing itself to the products of the school, Dr. Moynihan mentioned that we have some 20,000 educational systems in the country and he does not propose to change that, but shouldn't there be a common goal? Other than just getting good grades, shouldn't we have a national standard or something that we are trying to achieve, a goal in citizenship and integrity and morals and something of this kind for the students that we are teaching other than just A-B-C grades so to speak?

Can you conceive this Institute addressing itself to the product, the kind of citizens that we want to produce from our schools, the products of these schools?

Dr. BAILEY. Mr. Congressman, I hope that an organization like the National Institute of Education would address itself to this kind of question and would fund experimental work in research and colloquies that would address themselves to this kind of question.

I say that at the same time I have very substantial reservations about the notion that there are some kinds of moral absolutes that ought to be handed down from the Federal Government and that ought to be taught in every school system in the country.

I find myself quite restive with that notion and if I could simply explain myself, I am philosophically a great believer in pluralism, that is, in a number of different kinds of ways of living and of looking at life.

Obviously there has got to be enough agreement on basic and moral value questions so this Nation can be fundamentally one.

Beyond that I frankly like the notion of some school districts having boards of education that are quite conservatively oriented, other school

districts having boards of education that are quite liberally oriented, and some boards of education that support the teaching of sex in family living courses, and others that feel that in terms of their culture, that is going too far too fast. I think we need an enormous amount of new energy imposed on the questions of values and the unfolding pluralism of our society.

I would be very reluctant to have the National Institute of Education come up with authoritative doctrine in this field. Am I making a distinction that is nonsensical? I hope not.

Mr. LANDGREBE. I appreciate very much your answer. I, like many folks, went to a smaller school and almost next door to that school was a church. Now we have huge schools with thousands of students. Who shall set the standards? There are a great deal of, a great many problems in our country and they are caused by people and their thinking. While we must permit diversity of thinking and I still insist that someplace somewhere there ought to be in the modern society guidelines for the behavior of people.

Shouldn't a free society have some sort of a target, some sort of a dream that we would like for our people to achieve to be trained and educated for, that they would have respect for other people and would tend to be a happier race?

What is education all about beyond just then being able to earn more money and be a more substantial taxpayer?

I don't want to argue and debate this. This will be my last statement. If you wish to comment further, fine, if not that is up to you.

Dr. BAILEY. I appreciate your position and I have, I guess, quite a simple answer to what is a complex question. If you are talking about ultimate goals of education, in our society.

Mr. LANDGREBE. Yes, why education?

Dr. BAILEY. Education because ultimately we want to produce generations of human beings to respect others and who themselves can have a joyful life.

Mr. LANDGREBE. Thank you.

Mr. BREDAMAS. Thank you, Dr. Bailey, very much indeed. We are grateful for your having come and we hope you will let us be in touch with you as we go into the legislation.

Dr. BAILEY. Thank you, Mr. Brademas.

Mr. BRADEMAS. Our next witness is Dr. Anthony Oettinger, professor of linguistics, Harvard University, and research associate on program on technology and society, Harvard University and a widely recognized authority on educational technology.

We are very pleased to have you Dr. Oettinger. If you could try, sir, to make the main points that you have set forth in your paper, then the members of our subcommittee would like to put some questions to you.

(The document referred to follows:)

PREPARED STATEMENT OF ANTHONY G. OTTINGER, PROFESSOR OF LINGUISTICS, HARVARD UNIVERSITY

Mr. Chairman, may I first thank you for inviting me to appear before your committee. I appreciate this opportunity to express myself on behalf of the proposal to establish a National Institute of Education. This is a matter in which I am deeply interested as a citizen with young children in a public school, as a college teacher and as a scholar deeply involved in studying and experimenting

with the processes and the technologies of learning and education. I should add that the views I am about to express do not necessarily reflect the official views either of Harvard University, where I am a professor and a research associate to the Program on Technology and Society, or of the National Academy of Sciences, where I am Chairman of the Computer Science and Engineering Board.

The statement in Section 2 of the bill of a requirement for "far more dependable knowledge about the processes of learning and education than now exists or can be expected from present research and experimentation in this field" is a most welcome recognition of a fact that has too long been ignored. In the course of the study of the impact of educational technology on the schools which I've reported in my book "Run, Computer, Run"[1], I grew critical of the premature application of processes and devices judged by some to be important additions to current practice on the basis of what I considered to be the flimsiest evidence. I concluded that recent attempts to introduce technological change into formal education have revealed how profoundly ignorant we still are.

I therefore see the establishment of a National Institute of Education as a necessary, constructive and timely action. I applaud the intent of the bill and I am favorably impressed by the analysis embodied in the *Preliminary Plan*[2] for the proposed institute. This latter impression is particularly pleasing to me, since it enables me to take some pried in the fact that Dr. Levien, the study director, was my student back in 1962. The comments and criticisms I am about to state are therefore offered in the spirit of enhancing the effectiveness of a proposal I see as fundamentally sound and in the national interest.

I should like first to express my agreement with an observation, made in the *Preliminary Plan*, which I believe should remain high in the consciousness of everyone concerned with the establishment and the critical initial stages of development of the NIE. On page 18, the *Plan* points out that "the nature of the behavioral and social sciences and educational research and development is sufficiently different from that of 'hard science' activities that considerable care must be exercised in translating the lessons learned in the management of one to the other." I think that many of the absurdities I have noted in *Run, Computer, Run* are a consequence of the mindless parrotting in realms like education of techniques and attitudes that have had spectacular but nonetheless limited successes in physical sciences, their applications, and their management.

One consequence has been a sharp, but altogether undeserved, loss of faith in reason. As Caryl Haskins points out in a recent report[3] "a progressively orthodox reliance on the sufficiency of reason to solve all of man's relationships with the world . . . may have laid the ground in some measure for the considerable loss of faith in reason itself that threatens our own age. . . . As Medawar has also noted, we live in an age more than touched by the damaging philosophy that reason itself not only is not *sufficient* for us; it is no longer *necessary* for us. That curious inversion can exert a considerable adverse influence, not only on science, but on all rational thinking."[4] The statement in the preliminary plan wisely acknowledges the necessity of reason but also the fact that reason, particularly as applied through techniques appropriate to the "hard sciences", is not sufficient. One clear consequence is that those concerned with the development of the new institution must be men of strong faith in reason who are also willing to strike out into uncharted territory unhampered by prevailing orthodoxies.

The tone of the *Preliminary Plan* is encouraging in this respect. I applaud the statement, on page 23, that "the phrase 'education of Americans' has been chosen in preference to 'American education' in order to emphasize that education in all settings, both within schools and outside of thtem, and of all Americans, before, during, and after the traditional school ages, should be within the scope of interest of the NIE." The main thread of my criticism will be that a later statement on page 23, to the effect that "the NIE should have a broad enough charter to enable it to follow the thread of an educational problem across the educational fabric", does not end with the additional phrase "and beyond".

Let me pick up this thread with the language "collect and disseminate the findings of educational research" in Section 4 of the bill (page 3, lines 3–4). The

[1] Oettinger, A. G., *Run, Computer, Run: The Mythology of Educational Innovation*, Harvard University Press, Cambridge, 1969.
[2] Levien, R. E. (Study Director), *National Institute of Education: Preliminary Plan for the Proposed Institute*, The RAND Corporation, Washington, D.C., December 15, 1970.
[3] Haskins, C., *Report of the President, 1969–1970*, Carnegie Institution of Washington.
[4] Haskins, page 17.

thread also touches the questions of "technical assistance" and "jointly financed cooperative arrangements" (page 3, lines 6–8) of Section 4 and the construction of the words "surveys" and "demonstrations" (lines 14–15) of the same Section.

As I've noted in *Run, Computer, Run* "when a President and Congress set great store in education as a weapon of social reform, agencies like the U.S. Office of Education or the National Science Foundation are put under great pressure to produce immediate results. But when a program must be successful by definition, the need for a good show often overwhelms scientific objectivity; after the curtain falls, little remains either of practical value or of added insight . . . Ideas that are promising as objects of research and honest experiment tend to give birth, through artificial dissemination, to broods of depressing fads." [5]

In the past, the dissemination of findings of educational research all too often has meant the hiring of glib PR men (called dissemination officers), flooding the world with glossy publications, and prematurely capulating locally successful experiments into a wider context where they almost invariably fail. Detailed examples of this sort of thing have been given in *Run, Computer, Run.*

The *Preliminary Plan* recognizes this problem and, indeed, correctly identifies one of its important roots in the statement on page 3, that "*techniques for bringing that harvest to the user, the teacher, are still primitive; the complex network of activities needed to link new knowledge with practice is, in education, only partially formed.*" On page 38, the *Preliminary Plan* adds that "effective R&D systems, such as those that serve industry, health, and agriculture, have developed complex networks of activities linking research with practice and have staffed them with specialists such as design, production, and sales engineers, agricultural extension agents, and medical detail men. The education R&D network by contrast, is incomplete and imbalanced."

It goes on, on page 39, to note the virtual absence of "research-based problem-solving activity in the operating agency", a statement whose cogency I especially savor, having just spent two years overcoming many prejudices and difficulties in establishing a small research program intimately linked with my own operational teaching responsibilities within my own university. Further on, on page 41, the *Preliminary Plan* recognizes that "the *private profit and not-for-profit institutional setting* could be strengthened by increasing its size and scope of activity. . . . These institutions provide the major setting in which large-scale, long-term developmental and experimental efforts can be conducted."

Unfortunately, in my opinion, there is no evidence in the remainder of the *Preliminary Plan* of a follow-through commensurate with the recognized importance of the problem. In this respect, the *Preliminary Plan* remains true to a tradition noted in the following words by Robert W. Locke:

"It may be worth noting that the effectiveness of research and development work done by the education industry in the Unted States is limited by the reluctance of public officials to place R&D contracts with profit-making organizations. As a result, the allocation by business of its R&D resources is made according to the goals of the individual firm, and these may or may not at a given moment be consistent with the goals of education." [6]

Stimulating and guiding participation by private enterprise in the educational process is a need which I think has been slighted in the *Preliminary Plan* in favor of a much more traditional partnership between the federal government and the existing state, local, and private education establishment. It is precisely on the matter of developing "the complex network of activities needed to link new knowledge with practice" that private enterprise could be at its strongest and where existing educational institutions have been at their weakest.

After noting, on page 37, that "when the critical mass for larger tasks cannot be achieved, individual researchers tend to pursue small tasks on their own" and that "these small tasks rarely cumulate to achieve major effects," the *Preliminary Plan* fails to relate this observation to precisely the some phenomenon on the other side of the fence, so far as that "complex network of activities . . . needed to link new knowledge with practice" is concerned. It seems unlikely to me that the profession of education as we now know it can, without the closest cooperation with private enterprise, "take the lead in designing systems that will satisfy the developing requirement for education that continues throughout life, that breaks some of the barriers between school and society, and that deploys technology creatively to broaden access to excellent education," as the *Preliminary Plan* states it should on page 31.

[5] Oettinger, pages 40–41.
[6] Locke, R. W., "Has the Education Industry Lost Its Nerve?", *Saturday Review*, Jan. 16, 1971, p. 44.

I therefore see a need for the Bill, the *Preliminary Plan* and the legislative history to reflect greater concern for developing, in the national interest, a broader partnership among government at all levels, existing educational institutions and private enterprise.

May I, Mr. Chairman, call to your attention omissions and commissions in the Bill and in the *Preliminary Plan* which, in my opinion, tend to limit stimulation of private enterprise and may I also suggest how the door might be left open in this direction. Before concluding my testimony, I should like to also add some thoughts about the need for guidance in this participation.

In speaking of "technical assistance to, or jointly financed cooperative arrangements with, public or private organizations, institutions, agencies, or individuals", Section 4 of the Bill is silent on the question of whether these prvate organizations may be profit or non-profit entities. In Section 7, there is an explicit restriction to non-profit entities but, as a layman in matters of law, the scope of this restriction is not clear to me. Page 7 of the *Preliminary Plan* cites the President's Message on Educational Reform to the effect that "the National Institute of Education would conduct a major portion of its research by contract with universities, nonprofit institutions, and other organizations". Here again, it is not clear whether the language leaves the door open or if it intends a total prohibition.

I suggest, Mr. Chairman, that the language of Section 7 and of Section 4 of the Bill be clarified so as not to preclude judicious experimentation by the NIE with the stimulation of participation by private enterprise, both profit and non-profit, in educational research and, more important perhaps, in developing the means for the effective application of the fruits of the research to learning in a manner consistent with the national interest.

In this respect, I would further recommend searching for language that will define "disseminate", "surveys", and "demonstrations" in Section 4 or amplify these listed functions in a manner that will encourage: 1) the development of means for effective application of research results and effective action, 2) surveys that might encompass intelligent market surveys relating needs to demand and leading to the development of "the complex network of activities needed to link new knowledge with practice", 3) drawing on broader experience than that available within formal educational institutions for the translation of demonstrations from one or a few carefully nurtured instances to a broad self-supporting market.

In the same vein, the *Preliminary Plan*, in discussing "Relations with the Education System" beginning on page 125, is relatively silent on general private enterprise, although it lists "private and non-formal education organizations" on that page and cites "Educational institutions outside the conventional, formal structure" as "increasingly important parts of the educational system" on page 131. As indicated on page 143 of the *Preliminary Plan*, questions on this subject were asked during the planning study, but I could associate only 7 of 134 of the people listed on pages 144–149 with this increasingly important part of the educational system and beyond.

Perhaps the issue hinges, as hinted on page 127 of the *Preliminary Plan*, on the matter of "OE implementation of the results of NIE programs" and on the suggestion—described as controversial on page 128—for "the provision in each OE bureau of a small mission-oriented research, development, planning and evaluation staff." In my opinion, however, development of the *means* for application and action is a proper one for the NIE. This problem is of such importance, it has suffered from such neglect and it is so common to *every* education mission that its fragmented consideration is not likely to be helpful at least until enough knowledge and practical experience have accumulated so that mission-oriented staff may derive guidance and support from it.

I therefore applaud the recommendation, made on page 131, that representatives of private and non-formal organizations participate on "appropriate NIE councils, groups, and boards" and that at the very least, there be "study by the NIE of these agencies, their needs, and their prospects."

In the same spirit, I support the recommendations, made on pages 102–103 of the *Preliminary Plan*, to the effect that the National Advisory Council "make recommendations to the President with respect to appointment of the Director of the NIE", that "members of the Council should be chosen on the basis of achievement and service" and that "they should be so selected as to provide wide representation of the views of educators, the R&D community, and the public." I am not sure, however, that restricting candidates to "the fields of R&D, education, or public affairs" enables wide enough access to private enterprise.

On pages 128 and 129, the *Preliminary Plan* recognizes the wide concern among federal agencies for education and education R&D. It states that "the NIE

must establish linkages with these Federal agencies also." Based on the need for guiding the participation of private enterprise in the educational process, to which I shall come in a moment, I shall suggest that the list of agencies given on page 128 might well be enlarged. Otherwise, I agree with the recommendation, made on page 103, that "some of the Council members might be senior officials of other Federal agencies concerned with education." However, as I'll make explicit in concluding, I interpret "concerned with education" more broadly than may be intended in the Plan and I draw your attention to this fact.

As an obvious corollary to the foregoing observations, I recommend emphasizing the third program element in Program Area IV, as tabulated on page 47 of the *Preliminary Plan.* Moreover, I would argue for some increase in the resources devoted to Program Area IV even at the expense of the first two areas. Recognizing the urgency of the first two areas, the first especially, I nonetheless believe that addressing priority concerns without a strengthened linkage between R&D and practice will continue to be more ineffective than all of us wish, and wasteful and inefficient as well.

I turn now to the question of guiding the participation of private enterprise in the educational process. Here I address myself especially to questions of educational technology. As I suggested in *Run, Computer, Run,* the successful use of educational technology requires a complex amalgam of people, processes and devices. Among devices, old fashioned ones—like books—are as important as the newer and more glamorous media like computers and television.

My concern in this respect is that the needs of education have, in my opinion, had little or no influence on patterns of development. The perception of their own needs by educators has tended to be unsophisticated and unknowledgeable, their translation of needs into demand, weak and ineffectual. Because of this, as much perhaps as for the reason given by Locke in the quotation I cited earlier, "the allocation by business of its R&D resources is made according to the goals of the individual firm, and these may or may not at a given moment be consistent with the goals of education" [7], even assuming—as is not always the case—that these have been cogently expressed.

I shall discuss one particular need, *for personal command over the processes and devices of education,* in relation to two critical issues, *compatibility* and *property rights.* Both the need and the issues are already quite evident with books, where the issues raised are complex enough. With respect to the newer media, the complexity of the issues is increased still further by the difficulty of seeing clearly future patterns of development. Indeed, these patterns depend on how we perceive them.

By personal command of media, I mean the ability of individuals or groups to create, choose and use materials in these media in a manner responsive to personal, group or local needs. Pencil, ball point pen, and paper, together with a variety of simple and cheap reproduction techniques, nowadays make it easy and cheap for individuals and very small groups to use writing as a medium of self-expression or communication. Conversely, modern presses and the development of elaborate private enterprise networks for creating, printing, marketing and distributing printed matter, have made the economies of large-scale mass production available to individuals through a wide choice of books and serial publications, from many compatible sources all protected by Constitutional guarantees of freedom of the press. More recently, advances in dry copying techniques have also significantly increased the scope for selection, adaptation, and recombination at the consuming end.

Except for very technical points, of concern primarily to booksellers or even more to librarians, questions of compatibility scarcely arise with book technology, inasmuch as both human readers and dry copying machines have no difficulty in coping with widely varied type fonts, although dry copiers do have some difficulties with unusual size or binding in publications.

The status of property rights, on the other hand, is one of chaos and turmoil. You are all aware, I am sure, of the tortuous history of the Copyright Revision Bill before the Congress. The inability of the various contending parties to come to terms on issues related to dry copying is surpassed only by the utter confusion surrounding the impact of the newer technologies, like computers and various advances in visual media, most notably television in its newer manifestations through CATV and cassettes.

Rather than taking your time to go into detail on some of the intricacies of these issues, I should like, Mr. Chairman, your permission to enter into the record

[7] Ibid, page 44.

a recent copy of the *Newsletter* of the Association of Research Libraries, describing the status of the case of William and Wilkins vs. the United States of America as of October 12, 1970 and, by reference only,[8] a statement of mine before the Senate Subcommittee on Patents, Trademarks, and Copyrights in 1967. Although not entirely up to date in a fast moving area, both documents will, I think, convey the flavor of the issue.

The main point I wish to make is that in the fundamental area of printed material, as well as in the newer technologies, questions of property rights and of compatibility have created a state of confusion and restraint that can only be inimical to the objectives of the present Bill. The issues at stake are vital to every facet of education.

Although less evident with book technology, compatibility problems are a major plague with the newer technology. Incompatibility among computers is notorious. The example of numerous mutually incompatible audiotape, film and videotape systems is long before us. Anyone who follows the pages of *Variety* can readily see evidence of a frantic scrambling for rights to the reservoir of existing pictorial materials and future productions in a manner consistent, at best, with "the goals of the individual firm" as described by Locke. For local consumption of these materials, we will be offered such systems as the CBS–EVR, which seems incompatible with anything else in principle, and several varieties of video cassettes which could be compatible but aren't.

In the pursuit of their goals, individual firms seem to have been heedless of the cost to education of a situation where materials from different sources can be used only through the intermediary of reproduction devices specialized to these materials and where local creation or adaptation is difficult to impossible. In reporting that "negotiations may be nearing conclusion among other Japanese electronics firms on the cassette videotape standard already reached by Sony, Matsushita and Victor of Japan", a recent article in *Electronic News*[9] comments that "agreement among the Japanese could become a potent marketing tool in the United States, benefiting all theoretically by reducing cassette costs and removing some confusion from the minds of potential customers. . . . Industry observers said the compatibility picture was far from settled, however, since the European contingent—led by Philips—has settled on a different cassette size and American developers are moving in several different directions."

So far as I am aware these and related developments in all areas of emerging educational technology, while of utmost importance to the future of education, have received no attention by those government agencies one would expect to be most concerned with them *from the viewpoint of education*, namely the Department of Health, Education and Welfare and the National Science Foundation. Indeed, I see no evidence of concern for these issues, either in the proposed Bill or the *Preliminary Plan*.

The scientific and technological basis of some of the problems I have attempted to illustrate might well fall under the charter of the NIE as described so far. However, policies that could vitally affect the impact of these problems on education are made, if at all, in various other federal agencies and, conversely, findings of the National Institute of Education should be brought to bear on policies made in these other agencies. Otherwise, lacking coherent policy guidance, industry will continue to allocate resources according to the goals of individual firms whether or not these are consistent with the goals of education or indeed with the national interest.

I would therefore recommend that careful consideration be given in program elements III–3 and III–4, on pages 78 and 79 of the *Preliminary Plan*, to the study of the scientific and technological basis and of the legal and policy externalities affecting personal command, compatibility and property rights. It seems fatuous to me to propose studies of the potential of new technologies for education when the pattern of development of these technologies may in the future be determined if not now already set by uncoordinated forces heedless of the needs of education. The analysis of legal and regulatory processes as they affect the future of education strikes me as an important potential responsibility for the NIE. I therefore also think of agencies dealing with various aspects of policy affecting educational technology as "concerned with education".

In keeping with this view, I should like to emphasize the statement of objectives and of means described on pages 128 and 129 of the *Preliminary Plan*

[8] Oettinger, A. G., Statement in *Hearings before the Subcommittee on Patents, Trademarks, and Copyrights of the Committee on the Judiciary of the United States Senate*, 90th Congress, 1st Session, Part 2, March 20, 21 and April 4, 1967, pages 581–589.
[9] *Electronic News*, "Japan Tape Standard Near?", February 8, 1971, page 46.

with respect to relationships with other federal agencies. The list of agencies should also be expanded to include, for example, The National Bureau of Standards, the Office of Telecommunications Policy, the Office of Science and Technology, the Federal Communications Commission, the Register of Copyrights, and the Patent Office.

I would recommend, in addition, that the coordination function envisaged in Section 4 of the Bill be complemented explicitly by a function to advise other agencies of the Federal Government with respect to matters under their respective jurisdictions which, as a consequence of the work of the NIE, are found to have or be likely to have a significant impact on education and the national interest. I thank you for your attention.

[Newsletter, Oct. 12, 1970]

WILLIAMS & WILKINS VS. THE UNITED STATES OF AMERICA: THE ROLE OF THE ASSOCIATION OF RESEARCH LIBRARIES

[Because the Williams & Wilkins case has been of great interest to the members of the Association of Research Libraries and because the decision in this case, when handed down, may have far-reaching consequences for research libraries and their patrons, it is desirable at this time to recount the activities of the ARL with respect to this case, from its inception through the trial before Commissioner James F. Davis of the U.S. Court of Claims, September 9–17, 1970.]

Dr. Martin M. Cummings, director of the National Library of Medicine, brought a report to the 70th meeting of the Association of Research Libraries (San Francisco, June 24, 1967) on the challenge to fair use recently presented to the NLM. (The report had been previously distributed to the ARL membership under date of June 6, 1967.) Dr. Cummings summarized the history of the Library's photocopying practices which began in 1934.

In 1956, the NLM pioneered in substituting photocopies of articles for the interlibrary loan of journal volumes. This practice was properly circumscribed to make it consistent with the doctrine of fair use, and until April 28, 1967, it had never been challenged.

On that date, however, the Williams & Wilkins Company, of Baltimore, Maryland, publishers of medical and scientific books and periodicals, informed the NLM that it would permit photocopying of its journal articles only upon payment of a royalty of 2¢ per page. The Library suspended copying articles in Williams & Wilkins' journals while it studied the question. After receiving an opinion which supported its photocopying practices from the General Counsel of the Department of Health, Education and Welfare, as well as evidence of support from that part of the library community most likely to be affected by a court decision in this matter, the NLM informed Williams & Wilkins that it intended to make photocopies in accordance with the fair use provision of the Gentlemen's Agreement of 1935.

After hearing Dr. Cummings' report, the ARL voted to support the position of the National Library of Medicine (*Minutes* of the 70th ARL meeting, June 24, 1967, 8, 33–4).

On June 29, 1967, Mr. Verner W. Clapp, chairman of the Copyright Committee of the ARL met with the executive board of the American Library Association, in the absence of the chairman of the Committee on Copyright Issues of the ALA, Dr. Charles F. Gosnell. Subsequently, the executive board of the ALA acted to support the National Library of Medicine in its practice of making photocopies for scholarly purposes. This action was reported to the ALA Council by Miss Mary Gaver, president of the Association, on June 30, 1967 (*Proceedings* of the ALA, 138, 1967; *Library Journal*, 92, August 1967, 2722).

On February 27, 1968, Williams & Wilkins entered suit against and claimed damages from the United States Government in the U.S. Court of Claims. The suit alleged that the library of the National Institutes of Health and the National Library of Medicine had infringed its copyright by photocopying articles in journals to which the firm claimed copyright. One of the officers of Williams & Wilkins stated (in the firm's house organ, "Kalends," May–June, 1969) that the firm did not wish to interfere with the photocopying of articles in its periodicals, but that it merely wished to be paid a royalty on each copy made to offset loss of sales.

At the 72nd meeting of the ARL (Kansas City, June 22, 1968), it was reported that the board of directors of the Association h. d authorized its executive director (Stephen A. McCarthy), its legal counsel (Philip B. Brown, Esq., of the Washington legal firm of Cox, Langford and Brown), and the chairman of its Copyright Committee (Mr. Clapp), to investigate the appropriate course of action to be taken by the ARL with respect to the suit of Williams & Wilkins (*Minutes of the* 72nd ARL meeting, June 22, 1968, 36).

Pursuant to this authorization, the gentlemen mentioned met and reviewed the situation. It was agreed that the most meaningful action the ARL could take would be to enter the proceedings as a friend of the Court, should such action become necessary. Meanwhile, they agreed to make inquiries regarding the status of the case and to ascertain whether there were other methods by which the ARL might support the National Library of Medicine. With this end in view, Messrs. McCarthy, Brown and Clapp met on August 12, 1968, with the attorney assigned by the Department of Justice to the case, Thomas J. Byrnes, Esq. On October 21, 1968, they convened a meeting with representatives of the NLM, National Institutes of Health, the Department of Health, Education, and Welfare and the Department of Justice. As a result of this meeting, the representatives of the Association compiled and distributed certain data for possible use in the trial.

During subsequent meetings of the ARL, regular reports were given to the membership of the actions taken by its representatives under the authorization of June 1968 and of indications of the progress of the suit, which was limited principally to the prosecution of pre-trial explorations (*Minutes* of the 73rd ARL meeting, January 26, 1969, 47; 74th meeting, June 21, 1969, 48; 75th meeting, January 17–18, 1970, 66).

In the first week of August 1970, it was learned that the case would be tried beginning September 9. Accordingly, the representatives of the ARL alerted other concerned library and educational groups whose interests were involved and began to organize a brief representing the views of the Association. On August 20, 1970, the representatives of the ARL met once again with Mr. Byrnes to discuss the issues.

The case of Williams & Wilkins vs the United States came to trial on September 9, 1970, before Commissioner James F. Davis of the U.S. Court of Claims. The plaintiff was represented by Alan Latman, Esq., of Cowan, Leibowitz and Latman of New York, N.Y. (In 1958, Mr. Latman had prepared the report on fair use in the Copyright Office series of studies toward the revision of the copyright law; and the defendant by Mr. Byrnes. Among the plaintiff's witnesses were—

William N. Passano, President, Williams & Wilkins Company; Andrea Albrecht, Head, Market Research, Williams & Wilkins Company; Robert Berliner, Deputy Director for Science, National Institutes of Health; Donald T. Chalkley, Special Assistant to Director of Division of Research Branch, National Institutes of Health; Karl Heumann, Federation of American Societies for Experimental Biology; and William Scott, Professor of Urology, Johns Hopkins University, and editor of a Williams & Wilkins journal.

Among the defendant's witnesses were—

Martin M. Cummings, Director, National Library of Medicine; Col. Pilchar, Chief of Gastroenterology, William Beaumont General Hospital, Texas A. J. Gabor, Assistant Professor of Neurology, University of California at Davis; Seymour I. Taine, Librarian, National Institutes of Health; Victor A. McKusic, Professor of Medicine, Johns Hopkins University (author of one of the photocopied articles in question); Jason L. Star, Professor of Medicine, University of Texas (author of one of the photocopied articles in question); Albert Berkowicz Deputy Chief, Reference Services Division, NLM; Scott Adams, formerly Deputy Director, NLM; Benjamin M. Banks (author of one of the photocopied articles in question); and Robert Blum, consultant in economics.

On the first day of the trial, Mr. Byrnes offered the Gentlemen's Agreement of 1935 in evidence, but the Commissioner refused to admit it. However, the next day he permitted it to be submitted, subject to interpretation of its significance.

On the third day of the trial, Mr. Byrnes moved for dismissal on the grounds that the plaintiff had not proved title to the photocopied works and that he did not represent the true parties at interest. On the fourth day of the trial, the Commissioner denied this motion.

The trial concluded shortly after noon on September 17, 1970. The Commissioner announced that the record will be closed as soon as the trial transcript

has been filed, with the exception of certain interrogatories to be submitted to a witness who at present is abroad.

Mr. Philip Brown, ARL legal counsel, is preparing an amicus curiae brief to be filed with the court. It is expected that the American Association of Law Libraries and the Medical Library Association will join with the ARL in submission of the brief.

BIOGRAPHY OF ANTHONY G. OETTINGER

Dr. Oettinger is Professor of Linguistics, Gordon McKay Professor of Applied Mathematics and Research Associate to the Program on Technology and Society at Harvard University.

He has served as chairman of the Harvard University Computing Center and as President of the Association for Computing Machinery. Currently he is the chairman of the Computer Science and Engineering Board of the National Academy of Sciences and director of Project TACT (Technological Aids to Creative Thought), sponsored at Harvard University by the National Science Foundation. He is a Fellow of the Institute of Electrical and Electronics Engineers, the American Academy of Arts and Sciences, and the American Association for the Advancement of Science, and a member of the Phi, Beta Kappa and Sigma Xi.

He is the author of *Automatic Language Translation: Lexical and Technical Aspects, of Run, Computer, Run: The Methology of Educational Innovation* and of numerous papers on the computer sciences and their applications.

As a consultant to Arthur D. Little, Inc. since 1956, he has worked with management information systems in the banking, securities, insurance, railroad, communications and other industries; while on leave with Bellcom, Inc. in 1963–64, he became familiar with the management systems of NASA's manned space flight program; as a consultant to the Office of Science and Technology, Executive Office of the President, since 1961 he has worked on information problems in the Executive Branch of the United States Government.

STATEMENT OF DR. ANTHONY OETTINGER, PROFESSOR OF LINGUISTICS, HARVARD UNIVERSITY, AND RESEARCH ASSOCIATE TO THE PROGRAM ON TECHNOLOGY AND SOCIETY, HARVARD UNIVERSITY

Dr. OETTINGER. Thank you, Mr. Chairman. My observations are based not only on reading the bill, but also on reading the Preliminary Plan. A number of my comments are addressed to both.

On the first point that I want to make, I may be somewhat at odds with Dr. Bailey's analogies with moonshots. I rather lean toward a statement made in the preliminary plan that "the nature of the behavioral and social sciences and educational research and development is sufficiently different from that of 'hard science' activities that considerable care must be exercised in translating the lessons learned in the management of one to the other."

In my book, "Run, Computer, Run," I went to considerable length to outline specific instances in which I felt that the misapplications of science outside of realms where it makes sense can lead to many difficulties.

I also would like to emphasize my delight with the introduction of the phrase "education of Americans" in place of "American education" in the preliminary plan, as a recognition that the process of education is not necessarily a monopoly of any particular kind of institution, as we have recently grown to assume.

There are many aspects of both the NIE and the preliminary plan that one could address oneself to. I have chosen one aspect which is

of particular concern to me, although a number of others are obviously equally important.

I refer to the statement in the preliminary plan about techniques for bringing the harvest of research, whatever that may be, to the teacher and about the fact that these techniques are still primitive.

Although the preliminary plan recognizes this, and the bill to some extent recognizes this, a gap is left, I think, by leaving out of consideration a creative exploitation of the potentialities of private enterprise, broadly conceived as ranging from due education industry to storefronts schools, and I sense with some uneasiness the possibility that the good intentions behind the NIE proposal may, if one does not pay attention very carefully to this lead once again to the status quo through a continuing primacy of the existing educational establishment, whether elementary, secondary, or higher.

One place where private enterprise could, I think, complement the present form of the educational system in a particularly useful way, is on this question of dissemination.

I think hardly any word in educational affairs has been more abused than this word "dissemination." It implies the existence both of something to disseminate and of mechanisms that are effective, but I think all too often what has happened is that one has set up fancy PR institutions, and that very little of substance has happened.

If there is one area in which private enterprise, with appropriate guidance, has perhaps more experience and more resources to offer, it is in this question, if you will, of marketing, of bringing from research to the consumer the innovations that are worthwhile.

And yet we have a major gap—and this is not only in education but in a number of areas that depend on research—between the laboratory and the consumer. There is very little—and not only in education—by way of mechanisms for translating research results into effective use, for translating the statement of a need into demand, since these are not necessarily the same thing. In my written testimony I have gone into more detail on precisely what I mean by this, and I've indicated some suggestions about how the preliminary plan and the bill itself might be modified to take these problems into account.

One of the grave problems in the past, in educational research, and so on, has been the assumption that some one device, some one process, some one institutional framework would solve all of our problems. I don't want to even vaguely suggest that more extensive participation by private enterprise would be the key to everything.

In particular, I recognize that to the extent that private enterprise has participated in the educational process to date, the results have not always been very favorable. In that light, I address myself to two critical issues which are partly a responsibility of private enterprise but partly beyond their sole control.

These are issues of compatibility and property rights. These get to be technical questions but I am addressing myself here specifically to certain aspects of educational technology, whether we are talking about books or computers, or videotapes, cassettes, and what have you. Left to its own devices, what industry has produced and is producing are the materials that are unreliable, incompatible with one another, putting an enormous burden, both financial and intellectual, on would-

be users of these products to the point where, as seems to be the general observation, they stay on the shelf and particularly they stay on the shelf in those circumstances where they are out of the hands of professionals.

Where you have a situation where a campus or a school system has a professionally run studio, then things work better, but I regard—and I mention this in the written testimony—as an important ingredient of any scheme or application of technological assistance, the need of personal command by the consumer over the devices of education and illustrate this with respect to book technology where we expect that what we do with a book or how we do it is our own personal business.

Dry copying has enormously increased the scope of selection by the individual teacher, by the individual student of what he avails himself of among the fruits of mass production. We have pencil and paper and cheap reproduction techniques that enable a student, a teacher, any kind of local group to produce and share their own written materials. In most other aspects of the more recent and glamorous manifestations of educational technology, these facilities not only do not exist but one gets the impression that very little is done by private enterprise to bring these kinds of facilities to a point where people can use them for their own private, personal or local ends.

I, therefore, recommend that the bill address itself more specifically to the issue of advising other parts of the Federal Government on issues like copyright and other facets of property rights, on issues like compatibility, which, in terms of the means of education, are highly significant.

There are many factors that block change. I have singled this one out. I don't wish, by singling it out, to imply that it is the only one. It is a significant one, and one that is typical of many issues which transcend the resources of the house of education, where, indeed, the question of who is responsible is very difficult to answer if there is any answer at all.

Unless the NIE is so constituted that it can look at policy issues, look at questions that, by a narrow definition of education are not educational, but by a broader definition may be very critical bottlenecks in this process of bringing research results to fruitful application, I fear that this new enterprise will be impotent through finding itself blocked by issues over which it has neither control nor influence.

Mr. BRADEMAS. Thank you very much, Dr. Oettinger. Those are very stimulating observations. Let me put a question to you following from your observations about the problem of compatibility and going still more broadly to your comments about the unwarranted hopes from technology in the years gone by. This subcommittee also has jurisdiction over educational technology legislation, as you may know, and it is our hope that we will be addressing ourselves to some of those issues even as we go into the NIE.

I think it was Dean Sizer of the Harvard Graduate School of Education who some years ago suggested an education consumers union. I don't know if that is exactly what he called it but that was the idea, the point being to help, let us say, a hard pressed local school board or school system try to make some intelligent judgment about whether it should put some of its money into a given kind of educational medium

or a given system of educational media—and I include software as well as hardware.

What do you think of an idea like that, considering the problem of capability? Won't that be the kind of issue that could be addressed by such a network?

Dr. OETTINGER. I think of it as one institutional mechanism among several that would be valuable. In itself, it is not likely to be sufficient.

An uninformed consumers' union may wield considerable political clout but not necessarily intelligently. There is no place nowadays in the literature, or even by hearsay, to get significant honest evaluations of materials.

The current situation respecting consumer informaton, and on this again I disagree with some of the things said in the preliminary plan, is a little bit like what happens with medical detail men, who are not so much agents of education as of propaganda. The NIE should regard as one of its responsibilities the analysis of products, somewhat in the manner of the National Bureau of Standards, with the clear understanding that in doing this job honestly, it might well risk getting itself into controversies of the battery additive type. It seems to me someone has to fulfill that function because otherwise individual consumers and unions and the like will not be able to act intelligently and effectively.

It seems to me that this shades back again to the advisory function of NIE. In other realms. Government procurement practices and regulations have had a significant impact on de facto compatibility, standardization and the like and, while I would argue that Federal control over the contents of education is not desirable, some exercise of influence on means and methods, especially as they affect technologly, is essential.

Mr. BRADEMAS. Thank you very much. Mr. Reid.

Mr. REID. Dr. Oettinger, I would like to thank you for your very pertinent and somewhat fresh observations. I think there is no question that who is responsible is a fair question and I think the problems of copyright and of copying is clearly before us.

Let me also ask if you would expand just a little bit about your sentence that perception of their own needs by educators has tended to be unsophisticated and unknowledgeable and their translation of needs and demands ineffectual.

From the standpoint of the problems in America we were discussing a little bit earlier, there is a need to have research which is not precisely directed but which will help us get at some of these answers. Otherwise, it looks to me like we will be raising a certain percentage of a generation, 40 percent in New York City, that just will not catch up in reading or anything else.

What are some of the needs of educators that you see for which there is not sufficient recognition at the Federal level and which, other than research centers we are not providing for?

Dr. OTTINGER. I think this question of being better informed about tools, techniques, facilities that are available to them is one.

I mean this in a much broader sense than the question of what kind of gadget or what kind of movie projector.

Take visual materials, for example. Libraries, if one looks at hearings before the Congress on problems of information, both in the private sector and the public sector, one realizes that libraries and in-

formation systems dealing with the printed word are having difficulties.

But they seem in excellent shape when compared to the situation with visual materials. There is no place where a teacher can turn to, to find some sensible, critical, and reasonably complete description of visual materials that are available.

They are dependent almost entirely on random fragmented education sales blurbs, if they get anything at all. This seems like a small point, but it hides a major problem whose solution, like those to many of these minor-looking appendages that one dredges up in looking at this issues, would have considerable impact financially and otherwise.

Mr. REID. I agree with you on that but let me take it a step deeper. Certainly many of us recognize that education is not working the way it should in this country.

It is clear that we are not relating to many kids. Spanish is not being taught in areas where it is spoken, and so forth.

What are the concepts, where are we going wrong, what are the kinds of research into the learning process itself or the environment or the way we go at it or the schedule that we should be thinking about so that education per se meets the needs?

Dr. OETTINGER. Look, many of these things are going on. I agree with Dr. Bailey that if one looks around at experiments that have happened, that are going on, there is much to draw on. There have been experiments with open schools and freer schools and more teacher initiative and storefront schools and audiovisual aids for teaching Spanish, and so on.

There are two ways in which we fail to follow through. One is to recognize—and there Dr. Bailey's point about 20 years is well taken—that there are very many fundamental issues of how children learn, about which we know very, very little. It will take a long time to find out, and the leverage from this will not be immediately obvious.

But on a number of other issues we take experiments, we run them for a year or two, then the money runs out and there is no followthrough. In the case of IPI, first Dr. Bailey mentioned the instruction system encouraged through one of the regional laboratories, the followthrough was only lateral in that a number of elementary schools were taken into the experiment, but there was no followthrough vertically so that, by the time these kids went out of their elementary school, they ended up in a high school where indeed, according to testimony I heard about 3 years ago, the principal deliberately distributed these kids all over his school so that the effect would be lost.

So long as our span of attention is so short as to fund a project and then fail to follow through the implications as the kids move on, both in keeping track of what happens to them and in setting up the conditions so that as they move along one creates conditions that capitalize on what happened earlier we shall fail to tend even to obvious needs.

The emphasis on preschool education, on nutrition, et cetera, is fine, but then what happens when the kids that are exposed to the preschool ends up in the same old first grade? The teachers despair and the children get bored and unless you move ahead of these experiments so that kids who are subjected to an experiment at one level have a clear

track ahead, so that the information is not lost and so that, from a kid's point of view the benefits are not lost, little worthwhile has happened. We need to concentrate much more on following through with some of the experiments that get started rather than taking any one of them and immediately applying massive dissemination and trying to make it a national program at the first grade and then have nothing at all at the second grade.

Mr. REID. Thank you very much.

Mr. BRADEMAS. Mr. Landgrebe?

Mr. LANDGREBE. A brief observation. We have had testimony before this committee that education is getting twice as great a share of the gross national product as it was serving in 1940.

I would hope that in your comments you would not indicate that Congress has neglected education.

On the contrary, it would appear that we have been rather generous at all levels of government in educational effort. It is possible that educators themselves have failed us and perhaps this institute is what is needed to have the continuity that you allude to. Would you feel that this would perhaps make a more efficient operation and give continuity to educational programs?

Dr. OETTINGER. I think the need for continuity is essential and in a sense even more so than the need for greater funds because larger funds applied on a discontinuous basis strike me as more wasteful than smaller funds applied on a continuing basis.

Your comment about educators being in this as well as the Congress is, of course, well taken. I hope the NIE will help increase efficiency and continuity. As my earlier remarks were meant clearly to imply, I don't believe that professional educators necessarily have all the answers and that the process of education, the education of Americans, is something that can and should take place in many ways other than in the formal institutions of learning and education that we recognize today.

Mr. LANDGREBE. One more short question. Would you believe, or is it your impression from your studies of this institute that it could actually save money, that it could be a type of operation, that while it costs money, it will in the long run actually bring about a better educational program and possibly cost less money?

Dr. OETTINGER. There I would like to associate myself with a comment Dr. Bailey made regarding the chaos in the administration of higher education, similar problems in elementary and secondary and the example of regarding purchasing practices.

One does not need much 20-year leadtime research to come to the conclusion that purchasing practices and many other administrative practices in school systems are archaic, ill-informed and wasteful. But I think that for the NIE to make a contribution, it must be clearly recognized that this will be a controversial and risky enterprise and that the NIE must be set up in a way that will assure independence of judgment on the part of its officials.

While it should be responsive to the will of the people, I think it will need some measure of insulation from day-to-day pressures, because if it is likely to be useful in the way you suggest, it will occasionally make recommendations and findings that will be unpopular in some quarters. When you save one man money, you are in a sense not putting it in the pocket of a potential recipient and he will be unhappy.

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Mr. LANDGREBE. Thank you very kindly.

Mr. BRADEMAS. Mr. Peyser.

Mr. PEYSER. Doctor, I wonder if you feel today that there is grass-roots educational support for the NIE? In other words, among the professional organizations in education and teachers associations, do you feel that there is either a possibility for support of this program or any knowledge of it?

Dr. OETTINGER. I have no firsthand information about this. My guess would be that on the basis of past performance, there would a fair measure of opposition.

This is why I am concerned, as indicated in my testimony, that although Dr. Levien has done an excellent job of canvassing opinion, I am somewhat disturbed about the fact that out of a hundred or so people that he consulted, such a small number were, by their institutional affiliations, identifiable as outside of the existing education establishment.

And if things run true to form in this institutional setting as they do in others, I would anticipate that unless this committee takes, and eventually, the administration of NIE also takes some extreme care, then, if the enterprise is born at all, it will apply a new label to the status quo and not much will happen and I think this is perhaps one of the most serious problems to be faced in creating this new institution.

Mr. PEYSER. This is my concern as well. I am just wondering, as an educator, what thoughts you would have as to how the organization, if it were set up, is going to effectively reach the education community in order to gain support and acceptance of the programs and even before they are created, in other words, a willingness to say, here is an organization and let's work with it and support it and because I think in the past there have been at the so-called grassroots level great resistance to many of these programs.

Dr. OETTINGER. I think that at the grassroots unorganized level, there may be a great deal of support. There are many people, I am quite sure, both within elementary and secondary and higher education who would welcome, as I do, such an institute, and who would, as individuals, be eager for its creation.

I might add that I am perturbed by the notion that the head of this institute would be at such a low level, relative to his colleagues in NIH or NSF. I would regard this institute as having, given the importance of education to the Nation, every bit as much importance as the National Institutes of Health and the National Science Foundation.

I think that to have the head of this organization be at the low level which from the start is envisaged in the present bill, will almost assure that if outside groups don't abort the enterprise, its colleagues with the Federal establishment will strangle it. And if the NIE is to be taken seriously, then I think some careful thought should be given to raising the level, the reporting channels of this man to assure him the ear of the Secretary, to assure also, as I suggested in the committee testimony, that there be clearly written into the legislation an advisory function to other parts of the Federal Government that have responsibilities impinging on education.

Mr. PEYSER. Thank you.

Mr. BRADEMAS. Thank you very much, Dr. Oettinger. I thank you for your testimony. We have benefited greatly from your observations.

Our final witness is Dr. Dwight Allen, dean of education, University of Massachusetts.

Dr. Allen, we are pleased to have you with us today. Your statement will be included in the record and you may summarize, after which we will ask questions.

(The document referred to follows:)

BIOGRAPHY OF DWIGHT W. ALLEN

Personal Data: Date of Birth: August 1, 1931. Married: 3 sons, 2 daughters.

Education: A. B. With Distinction, 1953 Stanford University in History—with Honors in Humanities; M.A. Education, 1957 Stanford University; Ed.D. Education, 1959 Stanford University. Dissertation: Evaluation in Social Studies Classrooms: Ideal and Practices.

Positions Held: Instructor, Athens College, Athens. Greece, 1953–1954; U.S. Army, 1954–1956; Secondary School Teacher, 1957–1959; Research Assistant in History of Education, Stanford School of Education, 1958–1959; Research Associate, Secondary Education Project, Stanford School of Education, 1959–1962: Assistant Professor of Education, Stanford School of Education, 1962–1965; Associate Professor of Education, Stanford School of Education, 1965–1967; Coordinator, Secondary Teacher Education Program, 1962–1967; Director, High School Flexible Scheduling and Curriculum Study, 1960–1967; Director, Project for Flexible Scheduling and Vocational Educational through Computer Scheduling, 1964–1967; Consultant, White House Conference on Education, 1965; Director, Philippine Stanford Peace Corps Training, 1966–1967; Director, Stanford Mico-Teaching Study, 1962–1967; Director, Stanford Video-Tape Study 1963–1967; Research and Development Associate, Center for Research and Development in Teaching, Stanford University, 1966–1967; (Member of the Executive Committee and Administrative Board); Consultant, California State Committee on Public Education, 1966–1967; President, Junior Statesmen Foundation; Chairman, Planning Coordination Committee and Chief Consultant, Educational Professions Development Act, U.S. Office of Education, 1967.

Present Position: Dean, School of Education, University of Massachusetts, Amherst, Massachusetts; Member, Association of Colleges and Schools of Education in State Universities and Land-Grant Colleges; Chairman, Commission on Education for the Teaching Profession of the National Association of State Universities and Land-Grant Colleges; Treasurer, National Spiritual Assembly of the Baha'is of the United States: Member, Executive Committee, Education Development Center; Member, Board of Directors, Educational Coordinates; Member, Development Advisory Council, University of Massachusetts.

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ON THE SOCIAL INSIGNIFICANCE OF SIGNIFICANCE—A PLEA FOR NEW STRATEGIES OF EVALUATION

(By Dwight W. Allen, University of Massachusetts)

For those of us who have spent a good deal of time and energy in conducting educational research, it is always a trying matter to reflect on the total significance of what we have done. In a world filled with more impending and on-going social catastrophes than I care to repeat here, it is always a little bit disconcerting to spend one's energy searching for correlations between number of head nods by teachers and right answers on spelling tests by students. We can always invent rationalizations for some of our trivial research. We can sometimes convince others (and, rarely, ourselves) that our small-scale, narrowly-focused experiments will *eventually* reveal profound and relevant conclusions. But there is an enormous world to be crossed between teachers' head nods and my effectiveness as a teacher of citizenship with a student who was executed for murder several years later—not to mention the leap from there to cities which are exploding with violence and suffocating from pollution and overcrowding. New approaches, new techniques, new arenas must be found for educational research. Rather than decry the fact that no one thought to collect evidence or manipulate a program systematically in advance we must find ways to evaluate the results of programs after they have been implemented or even completed.

We have frequently been attacked by outsiders for dealing with trivial matters in our research and for failing to deal with the socially significant issues of our times. And, almost always, we have reacted defensively citing the need for "pure" or "basic" research, mourning the complexity of the big and important problems, demandnig more time to build the basic tools and models for researching the more difficult problems. I feel strongly that we continue to consider alternatives too narrow—too closely related to other fields. The stability and predictability of rows of corn have seduced us into demanding stability and predictability in rows of children before we can examine and compare them "properly." It is, by now, time that we faced such issues more honestly. There are important issues in and related to education that we have not been investigating and that we should be looking at. We know next to nothing about the relationships between teacher's attitudes, personality characteristics, and behavior. We have hardly touched on the relationships between teacher behaviors and learning in students. We have failed to create and encourage the alternatives that can provide the only hope for perspective on our current monolithic educational structures. The development of such alternatives should be considered as an integral part of educational research. We have a growing body of "humanistic" psychology that has wide implications for education and yet we seem almost afraid to get involved in research on the effects of sensitivity training and our research methodology ill equips us to do so.

We are in the midst of a strong educational movement toward giving more autonomy to students, and rather than capitalizing on the research possibilities opened up by a new range of alternatives we too often descry the whole thing as "anti-intellectual" or "unprofessional." We are growing into an age which voices more and more concern for the well-being of individual human beings, and yet we continue to use old statistical models which negate individual differences rather than developing new ones which might teach us something about them. We see the "hard" sciences readily recognizing the subjectivity of their work, and yet we fail to search for intuitive, subjective research methods in education, the one area which most clearly needs such approaches if students are ever to

be seen as people rather than "clients" or "subjects." Educational research must become more active, and educational researchers—or at least some of them—must assume responsibility for the development of new alternatives as well as means for the testing and validation of the old. We must learn to evaluate, with more confidence, the effects of varying time, space, context, environment sequence staffing patterns, and responsibilities and various juxtapositions of assumptions, resources, and rewards.

These are difficult problems—complicated, hard to approach with traditional research methodologies, and well beyond the kind of problem we *think* we can deal with in research right now—but they are crucial issues in education. They are problems whose social significance demands attention even if statistically significant results will be hard to come by. To put it most bluntly, we cannot afford to continue ignoring the difficult problems because we are not ready or the problems are too "sloppy." It may even be that we will only begin to get ready for such problems when we mount the courage to plunge in.

There are, of course, other sides to the neglect of research in socially significant areas. Most important, perhaps, is the fact that much of the research that has already been done in education is so consistently ignored in the practices of the schools. What we are doing in education has simply not caught up with what we know about learning, and that is a source of much frustration for those of us who continue to grind out the research. The educator who knows, through much painful research, the effects of sensory deprivation on young children is in a position not unlike that of the ecologist who knows that New York City is an unhealthy environment for human beings. To be the possessor of knowledge which never gets put to use in obvious and fruitful ways is a shattering experience. The obvious gap between knowledge and action, research and practice must clearly be bridged and that is a matter which we are justly pointing out to the practitioners. But, on the other hand, we have responsibilities for encouraging action based on the research that we rarely accept. It is doubtful, for example, that our standard tactic of doing more and more research on areas in which we already have good tentative answers is the best approach to encouraging their implementation. The argument is not so much against present efforts as it is to encourage other avenues. There is no doubt that more evidence is needed to evaluate the headlong, often chaotic efforts at innovation. But I am convinced that we have yet to find the proper point of entry.

I would like to urge the concerned effort to develop research techniques that can be applied after a program has begun—or even after it has been concluded. It is exciting just to think of how such methodologies would expand the realm of research evidence and further its use.

As Weston LaBarre has said in quite another context, "It is five minutes to midnight" and the problems which face American society cannot be dealt with by trying to slow down the clock. Increasingly society is turning to education to create the world we would all like to live in—not just to transmit the culture of our elders. We must begin to face difficult issues, admitting their complexity but not hiding from them behind the screen of conventional research methodology. And the rare, well-researched solutions to difficult problems will not become the living reality that they deserve to be without additional research into the context of their use and strategies for their implementation. The chasms between social and statistical significance, between research and action sit before us, waiting to be bridged. Either we begin building, or wait for the earthquake to bring the sides together.

Educational Research, 1969.

THE NATIONAL INSTITUTE OF EDUCATION—NEED AND PROMISE

(By Dwight W. Allen, University of Massachusetts)

One school district in the United States which is implementing a federally funded project based on the assumption that "school can be and should be an *enjoyable place* for children to be" recently adopted several significant changes. Gun-bearing policemen were brought in to patrol the halls and keep out outsiders; students who are late to school are paddled by a staff member whose specific assignment is to administer paddling; a stricter student dress code is being considered by the staff; and all the school incorrigibles have been selected out of regular classrooms by the teachers and placed in an isolated structure where the students are smilingly referred to as "the apes" by the rest of the

school—and themselves. Incidentally, the first goal of this project is to "improve the self-concept of students."

RESEARCH AND THE SCHOOLS

Appalling as this is, it is not an uncommon portrait of the state of educational innovation in February, 1971. What is wrong? The people in this school and others like it are not stupid. One obvious conclusion is that there is a massive *and growing* gap between what is *known* about learning and what we *do* about that knowledge. The argument in this testimony is pure and simple. American education desperately needs an action research program which will relate educational knowledge and the search for knowledge to specific school programs and school students.

Despite all we know about the value of building self-confidence and giving learners positive reinforcement, the public schools in the community from which I testify (a community which has five colleges and universities within a ten-mile radius) still send home report cards which give children C's, D's and F's in reading—*in the first grade!*

Serious comprehensive and systematic examination of knowledge, programs, and evaluation techniques and the consumable dissemination of those examinations by the National Institute of Education will make it possible for the students of West Reading, Pennsylvania to benefit from the methods used in Helena, Montana. Evidence shows that at present it usually takes between 25 and 125 years for this transmission to occur!

Another conclusion we can make about the use of research in schools is that there is no accepted operational way for this to happen. Personnel are assigned to paddling, but not to research. Statistics are primitively gathered on attendance, vandalism and standardized achievement. The selection of their particular variables is made because the information is available, but the correlation between student learning and broken windows is dubious at best.

Another factor which handicaps school research is the total immersion of the research effort into the frantic activity of school. The inconsistency of bringing policemen into an "enjoyable" school is brought about by a reaction to community clamor over lax attendance regulations. Clearly what makes sense on paper is not always appropriate in the actual school content.

Finally, the temporariness of school research efforts produces limited effectiveness and validity. Shifting priorities, changing programs, new personnel and the crisis orientation of most schools prohibits meaningful research.

Staff training, methodology and instrumentation, independence and reparation, and permanency, then, are areas which need national attention if research is to be effective in schools. A direct and lasting relationship between the school and the proposed National Institute will make a significant contribution in the correction of these areas of deficiency.

PUBLISH OR PERISH

What is wrong with educational research now? The most detrimental factor is the preponderance of university-based, individually done, unrelated and unresolved student and faculty academic work. The college world of credentialism requires this independent work. Reputations, position, tenure, salary and degrees are gained by publishing articles and dissertations on obscure findings or conceptual studies.

What is required, of course, is an imaginative research structure which capitalizes on the fruitful leaps from dreams to reality and from reality to dreams. It simply will not do to have ivory tower research on the one hand and nitty-gritty development or implementation on the other, with neither realm tarnished by contact with the other. What we desperately need at this point is a new set of models which apply to the development side of research and development. We need models which will make implementation dependent upon on-going research, and research dependent upon current innovations. We need a new educational structure which will permit ideas generated by research and/or good intuition to be implemented, thus generating new ideas for research which will, in turn, feed new ideas for innovation. . . . We need a structure whereby innovation and research feed back upon each other, reinforce each other, and hence perpetuate each other. Such models and structures currently exist, and are employed to great advantage, in private industry, and they tend to achieve

the flexibility required of such a system through the use of research—innovation teams composed of a wide variety of theoreticians and practitioners.

In the current world, change in education overtakes us more often than we bring it about. In such an atmosphere, the problem of researching changes looms larger than the problem of applying theory to educational practice, but in view of our rather suspect educational accomplishments the task of upgrading education in the field speaks eloquently for itself. In education, the problem is rapidly becoming one of discovering theory through practice, but we will not begin to develop either powerful theories or effective practices until we create structures which recognize the fruitful union between ivory tower and grass roots.

EXPERIMENTATION AND RISK

We need to reward risk considerably more than we currently do. We need to commit more resources, material and human, then we have so far been willing to commit to risk! We must be willing to risk time, money, even education and, I dare say, our jobs as researchers, educators, administrators, and teachers. We will be doing our profession considerably more good when we begin to produce significant failures, than we are currently doing via our ivory tower, trivial successes. In view of the need to change and the inevitability of change, the risk is not great. It is only made so by our fear of change. And if we had our wits about us, we would take every conceivable step to institutionalize change—to make it the very foundation of educational theory and practice rather than to defend ourselves against it. Furthermore, our research efforts must be backed up by whatever resources may be needed to remediate the effects of experimental mistakes.

To demonstration what I mean by remediation, let us take as an example a research project which commits a large number of the teachers and students in a given school to participation in a team-directed computer-assisted instruction experiment for one year. Predetermined criteria might show that by the end of the year the experiment resulted in a significant learning loss for most of the students involved. As a consequence, it might be necessary to commit four or five times the school's normal resources in order to remediate the loss. The cost of doing so for, say, 100 students involved in the experiment would not begin to approach the cost currently expended on misused hardware—a cost which could easily have been avoided had the hardware salesman functioned as a member of an active research team. But whatever the cost, the point is that it would have to be accepted willingly as a possible consequence of any research inquiry that is honestly committed to the improvement of educational practice.

It is unreasonable to expect that a comprehensive application of solution to existing educational problems will occur so long as the educational researcher is unwilling to act in the knowledge that the educational practitioner's problems are his own, and vice versa. The lack of such mutual cooperation helps to explain why administrators rarely organize schools so as to minimize the occurrence of mislearning, despite the strong research evidence that it is much harder for a child to relearn something he has learned incorrectly the first time. Schools that are convenient to operate, non-controversial, and in line with procedures that are easily defended by precedent are still the most envied. Researchers, on the other hand, seem not the least concerned with the knowledge that the evidence which they have compiled in favor of starting girls to school earlier than boys is having no effect whatsoever in getting girls to school one day earlier, even on a trial basis. The two examples are important as an indication of the practical limits of educational research as it is currently conducted, under the private auspices of personal ambition.

FOCUS ON PERFORMANCE

In his March, 1970 message on education reform sent to Congress, the President wrote, "the . . . need in the school systems of the nation is to begin the responsible, open measurement of how well the educational process is working. It matters very little how much a school building costs; it matters a great deal *how much the child in that building learns*. . . . School administrators and school teachers alike are responsible for their *performance*, and it is in their interest as well as in the interests of their pupils that they be held *accountable*. Success should be measured not by some fixed national norm, but rather by the results achieved in relation to the actual *situation* of the particular school and the particular set of pupils" (italic mine).

Behavior, not performance, seems to be the only object of measurement. Student attendance, dress, traffic flow, clean socks for gym, pencils for French, sitting quietly seem more important than a noticeable gain in achievement. We know that of all the teachers terminated the great, great majority are released on the basis of personal idiosyncrasy. Student achievement is seldom, if ever, taken into account. As the President says, to conduct this national campaign for accountability in schools, we need to "develop broader and more sensitive measurements of learning than we now have."

The National Institute can finance and staff and can develop the necessary tools to implement this campaign. It can go right to the jugular vein by a disinterested analysis of all the old accommodations in education. What is the correlation between teacher education and student learning, between certification and student learning, between hours of instruction and student learning, between school and student learning? Don Davies, Associate Commissioner of Education, says that this kind of demand for accountability "links student performance with teacher performance. It implies precise educational goals. It forecasts the measurement of achievement. It means, in effect, that schools and colleges will be judged by how they perform, not by what they promise. It means that we are moving in a direction we have been contemplating for a long time—shifting primary learning responsibility from the student to the school." Arthur Pearl at the University of Oregon summarizes our state of affairs a little more succinctly. "We do a lousy job teaching and we flunk the kid."

THE NEED AND THE PROMISE

To summarize what has been said so far, the proposed National Institute of Education can do much to unravel the mysteries and determinants of learning.

(1) It can *broadcast* the need, the survival need, for experimentation in the schools. It can build internal and external confidence in schools and their attempts to improve.

(2) It can categorize and display what we know about learning. With present technology, that knowledge can be catalogued and made available to every school in every district as soon as it is collected.

(3) It can help to train and support school people to organize and conduct research and development divisions in schools. These departments will help to bring about planned change and sustained change.

(4) It can help to develop instrumentation and methodology which can be used to judge the effectiveness of schools. Indices of learning growth will be identified as part of a systematic and scientific campaign.

(5) It can provide a cadre of experts who will analyze all the studies in a problem area as opposed to the usual procedure of studying one problem here and one problem there without any attempt to correlate them.

(6) It can provide a sustained and permanent research base which will generate longitudinal and replicable studies. This approach is much needed to balance the tenuous effects of federal grantsmanship, community whimsy, staff changes, and public relations "research."

(7) It can concentrate on a particular student's growth over several years, or a particular teacher's performance within a particular situation. Most research now focuses on the ideal state—finding the best model, the best curriculum, the best training. An effort must be made to produce more situational specifications.

(8) It can provide immunity from the school setting at the same time it relates directly to the school. Withdrawal and objectivity are now practically impossible.

(9) It can balance the scholarly, independent "pure research" efforts in universities with action research programs in schools. It can also unite these two parallel thrusts so that they have a mutual relationship.

(10) It can support risk, through building confidence and through remediating experimental failures.

(11) It can establish experimental schools in which all participants are aware of the risks and willing to accept the consequences. These schools will have immunity much as the new Disneyland in Florida has been able to gain immunity from state regulations for its own school system. We will systematically set up competitive and alternative educational systems.

(12) It can develop a plan for accountability which will include measuring student development, both personal and academic, linking student achievement to teacher performance, designing specified teaching functions and roles, and defining curriculum programs in terms of student learning.

(13) It can provide a free "always open" consultant research service component for all developmental school programs. The creativity of program designers in schools will be balanced by the supportive educational data generated and situationalized by the Institute.

(14) It can review the vast array of non-school inputs to the learning process. It can collect and massage data on the effects and effectiveness of things such as media, nutrition, drugs, family background, and environments on learning.

(15) It can produce interesting and informative presentations of research findings in multiple forms—movies, videotapes, slide tapes, publications—which can be used by various publics for both training and awareness purposes. It can also catalogue, store and distribute these materials.

These are some of the services to educators, citizens and students which a National Institute of Education can provide. It can capitalize on the more specialized work of the Regional Labs and on the disparate works in universities. Equally important, it can help schools to adapt to the kind of research and development models now essential in science and industry—models which have designed, manufactured, and tested the most complex aerial weapons system known to man only five years after its conception; enabled scientists to wipe out polio and childhood diseases; and corrected a faulty radar system within two hours by a team of men some of whom were in Cambridge, Massachusetts, some of whom were at Cape Kennedy in Florida, and some of whom were ten miles from the moon.

These kinds of scientific capabilities must be used to solve other problems undeniably important to the survival of our country. In defense we spend ten percent of our budget on research. In education we spend less than one half of one percent.

The choice is ours. Either continue the cosmetic approach to solving educational problems by dabbling with little bottles of salves and lotions from our personal vanity, or plan future change by combining individual creativity with team scientific methods based on a reservoir of accumulated knowledge. The National Institute gives us, for the first time, an opportunity to design techniques, experiences, programs and schools which will make future education as remarkable and effective, as the twentieth century progress already demonstrated in medicine, mobility, management and media. That we have policemen in our schools is educational hypocrisy. Accepting policemen in our schools, as the way it must be, would be a national disgrace. How do children *really* learn in school is the question. We honestly now have little idea. Can we do better?

The National Institute of Education provides a hope that we can accomplish at least some of the multiple agendas that press in on us so urgently. But that hope is much less than certain. Will we be able to create an institute with sufficient independence and freedom to sponsor unpopular research or to follow a program of research long enough to really gain a perspective on its long range potential. Remember the first time the horse and steam engine ran a race. The horse won. We have yet to identify even the entries in our race to determine the successful future of education.

STATEMENT OF DR. DWIGHT ALLEN, DEAN OF EDUCATION, UNIVERSITY OF MASSACHUSETTS

Dr. ALLEN. I begin with the assumption that education is getting unsatisfactory. There are not villains to be found, or we would have found them and got on with the job.

I see educational professions devoting their lives to education of children but having lost sight of their objectives to the sense they don't know how to go about it.

The definition of a fanatic is a man who having lost sight of objectives, redoubles his efforts. I think we have a lot of fanatics in the business of education and also in the business of changing education.

Most teachers and administrators are more effective in the system than the system allows them to be. They have given up in terms of having any kind of basic impact on the system.

It takes all of your concerted effort just to stay afloat if you are trying to challenge any of the basic assumptions.

For example, in the Bureau of Educational Professional Development, Don Davies is doing an excellent job of trying to find a way out of the morass of the issue of career training but being checkmated at every point not because again there are people who are trying to do it in but because no one has a perspective on what is going on.

I guess if I were to sum up my feeling about NIE in one word it would be alternatives. That we perhaps need alternate types of education more than anything else.

I would agree that it is difficult in our pluralistic society to gain consensus on almost anything. One of the dangers I see is polarization of our society at present. The demand for consensus of education I think will further cut this polarization or further exacerbate the polarization.

We need to find a means to develop educational alternatives that do not require consensus. Let me give a couple of examples. Right now I consider our entire educational system, public and private, a monolithic system.

It proceeds from the assumptions of didactic instructions. It proceeds from assumptions that teachers know and kids don't. Assumptions that may have been true years ago but hardly true now when students have access to a wide variety to information outside of school.

The assumption that you have to go to school to learn. The assumption that schools teach the truth. If you look at it, the local school board does not have much control over the school.

The State controls certification. Colleges control college entrance requirements. The local school board is often left with choices of whether to have a course in photography or sex education. The image is local control of schools. I think so long as these myths surround the practice of education, we are not going to be able to find levers of appropriate change and here I think is where the National Institute of Education comes in. If indeed the National Institute of Education turns out only to research present practice, I think it will fail.

The single most important mechanism that has to be put into it is a mechanism to assure that we search for new alternatives and not simply refine old ones. I think that the crucial problems of education all bear on this. We don't have basic means of change strategies in education.

The change strategies that we have presume that someone controls education. I don't think there is a control of education. Education is a network and not a system.

It is a delicate balance of vested interests and to change education somehow you have to get at these vested interests. As the earlier witnesses have testified, we have not found out how to incorporate technological potential in instructions.

We have to find a way to overcome vested interests. Right now curriculum decisions in school are in the hands of the people who are affected by those decisions.

It is hardly possible to expect an English professor to vote to discontinue freshman English when the support of his graduate program depends upon teaching freshman English.

It is hardly possible that you are going to get credentialed teachers, to have perspective in education of student-teachers when that credential system protects their vested interest.

I think it is irony that a doctor can see a student alone in his office in the medical building but is prohibited by law from taking charge or seeing a student alone in school in an instructional situation unless he has a credential.

We need to find ways to bring the school closer to the community and bring the community closer to the school to tear down the walls between school and community. I would like to examine the basic assumption that schools should start at 8 and end at 3.

Maybe it should start at 6 or 7 in the morning and go to 10 and 11 at night. Maybe it should continue all year with teachers coming and going, the community coming and going. Why does Johnny go to school during the day and his mother go to school at night in adult education class?

Maybe having Susie go to sewing class with mother would be a fine thing in adult education. These are the kinds of things we need to explore. We have to link the levels of education together and right now there are separate divisions of elementary education, secondary education, and higher education, as if students can be compartmentalized in these three groups.

I see education as a continuous process.

The metamorphisis that we expect of students as they go from one level to another are some of the things that need to be investigated.

In terms of the process of the institute itself, autonomy, of course, is going to be an issue on control. I think the proposal to have it a separate agency within HEW is an appropriate one. The success or failure of that, however, will be more a result of the personalities and implementations of the legislation rather than the theoretical placement of the agency.

One of the problems in NIE that they will have, which is much more severe than in NSF, is the fact that everyone in the public is an expert on education, whereas in NSF, NSF could do all sorts of things and general public has no notion of how to respond to it.

In the National Institute of Education, everyone is an expert and everyone will respond. Somehow I think we have to find a way to isolate NIE sufficiently from day-to-day responses of people so that we can get some assurance of long range continuity, get some assurance that diverse programs can be funded and that we don't create the kind of commission mechanism that reduces everything to the lowest common denominator.

Any time you get a battle of views that have to gain consensus, you get the lowest common denominator.

I would rather see diverse alternatives simultaneously invested so that unpopular viewpoints could be encouraged. Money is not the prime problem in education. I think vision is the problem.

One of the major efforts of NIE would be to investigate ways in which major resources can be reoriented within the educational establishment. That programmatic evaluation must be a major thrust.

Someone ought to be looking at development of real time evaluation procedures so we can make some decisions about education in the context of educational experiment. I think it is the classical experi-

mental designs that don't work where everything has to sit still until you evaluate it and then you make a decision.

There is a difference in strategy between conclusion oriented research, and decision oriented research where you have to be mounting a venture in the absence of evidence.

Right now one of the ways in which the status quo in education continues is the fact that a different level of evidence is required to change an educational venture than is required to sustain it.

In other words, we don't have any evidence at all in terms of the way in which education is proceeding over the last hundred years or what the effects are, but any time you propose to change it, someone says show me the evidence, and I say I am willing to produce evidence as an educational innovator, in the same amount that you can produce evidence to sustain what is now being done.

In other words, I think that is a fair question because otherwise the educational innovator must produce evidence both for innovation and for status quo.

I would like to propose that perhaps we need a national system of alternative public schools locally controlled, exempt from all regulation except antidiscrimination legislation, operated on the principle of volunteerism. Rich kids have always had an alternative in our society. They could go to the private schools. I can see no reason why average kids and poor kids should not also have an alternative, in other words, not requiring them to attend a school that is divergent in its educational philosophy but allowing them to have option of attending such a divergent school if they wish.

Present school facilities could be reoriented for this concept. Attendance lines could be redrawn so attendance could be on a voluntary basis but the school would continue to serve the same clientele it now serves.

Perhaps different ages of children could be involved. Take elementary schoolchildren so it could be a cross generational program and schools might be a solution to the generation gap rather than part of the problem with the generation gap.

Right now, I think probably the problem of generation gap is exacerbated, by locking them away in an age group.

We need to find ways perhaps through alternative school mechanism to bring the community into the school during the day, have different courses available, having students out in the crafts laboratories of the community visiting public agencies, and so forth.

I think the National Institute of Education could develop a value of strategies for such programs in schools and could actually perhaps run more schools designed to highlight educational and evaluational alternatives.

There are many other things I could say. I would only like to say that one of the problems in education is that our vision is distorted by our experience with the past and new technologies are now available.

Now options are available but we have not begun to look at them. One of our problems is that all of our educational leaders have been trained in schools in a simpler society and it makes it very difficult for us to throw off our biases and prejudices and indeed find a way to go forward.

As some have suggested, one of the main purposes of education in the future will be not to teach kids things, but to teach them to forget things so they will be unhampered by boundaries of experiences.

Mr. BRADEMAS. Thank you very much, Dr. Allen.

Mr. Reid, would you like to ask a question?

Mr. REID. Thank you very much.

Thank you, Dean Allen. I think you have touched on a number of the very provocative thoughts that are precisely what is relevant here.

You have talked about the need of vision, not money. You have asked what is truth and pointed out that many students do not find values or classroom experience compatible with experience they have outside of home.

There is almost a total lack of respect in the classroom in some cases. Our system frequently is monolithic.

You have suggested various ranges of alternatives, alternative school programs and the like. Could I ask you just to speculate for a moment on the word "vision," the kind of new experiences that might have meaning, that might have effectiveness, that would deal with the real world and not a world that people don't recognize any more.

I do think we tend to have fairly structured research. I suspect that time is very short. It does not mean that you apply a national program that you don't know anything about, but neither does it suggest that we continue to go as we are going.

If you would touch on the word "vision" the kind of thing that ought to be touched on, it would be helpful.

What would you suggest?

Dr. ALLEN. First of all you take the area of values. Right now a teacher is expected to be objective. I would rather use the term neuter. A teacher is supposed to be dispassionate in the way he views the world. This is not a real world.

I would rather see a school that was constructed on the premise that a variety of points of view were represented within the school. In fact, the school curriculum should encompass all that is legal and sanctioned in society in its full diversity, including religious points of view, political points of view, various issues and points of view on morality.

Then parents and their children should have the option as to which of these broad range of experiences they participate in. I think that this is more in keeping with what I would see the pluralism of our society than the present abstraction which is unrealistic.

I think unfortunately by default we teach agnosticism in the school because religion can't be taught until school—we can't agree on any partisan version for school.

Therefore no religion is taught in school, agnosticism is a default position.

In the same way it is unlikely we are going to get agreement on any of the major value areas in the near future.

I think that is no reason to reevaluate us out of curriculum. I think all legal sanctioned values in this society ought to have a place in the curriculum and we ought to have a way to have students gain access to that selectivity.

That is one aspect. Another kind of vision would be the vision of what education would be like if we changed some of the basic assumptions. For example, you have to go to school to learn.

I could see very easily, in fact, my professional judgment would be that by the year 2000, reading, writing, and arithmetic might be elective subjects in the school because there will be so many other places where you could learn those via television and via other kinds of nonschool experiences that only those students for whom that has not been taken satisfactory elsewhere would have to deal with them in school.

However, the required curriculum in the school would have more to do with quality of human life, with man's relation to man. Schools have been preoccupied with man's relation to things.

Now I think we need to shift more to emphasis on human relations and man's relation to man and the quality of life and the quality of environment and to help men gain perspective.

That would be a real flip-flop in terms of the basic assumption we now make about curriculum and staffing.

Mr. REID. On that, if I may interject a question, we never learn from history and like President Kennedy, we are frequently in a position of repeating the same error time and time again. What is it in our teaching that neither recognizes truth nor past experience?

Why are we condemned to repeat the same mistakes over and over?

Dr. ALLEN. Education historically for good reason has been preoccupied with information retrieval. The presumption is that you have to have a basic factual level of information before you can do anything.

But yet if you look at it, this produces some real anomalies. For example, I won't ask this august body to name the capital of North and South Dakota, or the capital of North Carolina and South Carolina.

But in this room I bet one out of four people can't do that. Yet you can't even get out of fifth grade unless you know that.

Now, the question is, is it stupid that we don't know it or is it stupid to teach fifth graders that? I once asked a fifth grade teacher, "What is it that you really want kids to know?"

She said, "I want them to be able to operate an atlas" and that finally boiled down to the fact it they could use an atlas that was probably an educated functional level.

So I suggested she allow kids to use the atlas the next time she gave the test. She said, "No. I could not do that."

I said, "Why not?" She said, "Because they would all get it right." The assumption is for someone to succeed, someone has to lose. So long as we establish an educational system that is based on the fact that the teacher is not doing his job until someone falls over the edge, we are going to be caught in the same morass.

Factual information is going to become increasingly less important. Processes and the way to use information and synthesize it and deal with it and speculate about it are going to become more important.

That is going to require a different kind of school, a different kind of teacher, a kind of interphase between school and society. You could, of course, for example, prohibit a school from requiring more than one-third of the curriculum and have other two-thirds depending on who is there and events of the world so the teachers and students could in fact become learners together.

You could get rid of the notion that teachers have to know everything, that you can give a little more credibility that we are trying to

teach kids to be critical thinkers and evaluate the likelihood of what they are hearing. If those are the kind of assumptions NIE starts dealing with, then I think it can be a successful and viable operation in terms of helping education go a step forward.

Otherwise it is just the frosting on the cake. There has to be really basic reorientation of the educational philosophy of this country. I think it is too bad that right now schools have lost credibility in society and educators say the reason we are not doing a good job is because we need more money.

I grant we may need more money but I really don't trust us as educators to spend it well if we have it. I look at free schools and they have budgets less than the public school budgets.

So I think what is called for is somehow to find two things. One, to create a symbol or set of symbols that can give people some hope about education and to create the notion that education can become the vehicle of upward mobility much like the Horatio Alger stories of 50 years ago.

At the same time we have to then create the regulatory mechanisms which will encourage experimentation. Right now within the educational establishment all of the rewards are for maintaining the status quo. Anytime you move slightly off center, you are shot at.

Right now as dean of education at the University of Massachusetts, if I run a standard operation, nobody minds. Anytime I move a little bit away from that and try and involve students more in the governance of the school, I am susceptible to criticisms from all sides.

I think there are ways to develop regulatory mechanisms or create experimental options to encourage experimentation rather than dampen it.

One is to avoid the need of consensus so those people who want to experiment with something, and those who wish to associate themselves in experimentation, have the right to do so. I think that is within the American tradition that we have the right to make mistakes, that we have the right to individual alternatives.

Mr. REID. Thank you, Dean Allen.

Mr. BRADEMAS. Mr. Peyser.

Mr. PEYSER. Your testimony, Dean Allen, does excite me in many positive ways and in some ways that would be negative ways, such as the alternatives that we are talking about. I think one of the real problems, and I don't know how educators are going to do this, but I think it is a problem, that a lot of these things come down to the public and local school boards and the communities that are involved and when you have meetings at local levels, and I think this is true in many communities, when we have educators who are visiting, whether it is a PTA meeting or a board meeting and speaking to the public, inevitably when they reach the point of kind of things they are talking about as a change, they have a policy of referring to reports and studies which the public does not have the slightest idea, and when this kind of a quotation comes out from the educator, the public nods their head and they don't know what the study is and the whole thrust of what is trying to be established is lost.

I am very hopeful that in the NIE, which I very much support the concept of this type of organization, educators are going to be able to talk to the public on it, because that is who the public is going to want

to hear from, is going to be able as a group and the message is going to have to come through from people like yourself to educators, that they have got to talk in terms that are understandable to the public and relate to the public because educators I think, and I don't want to classify all in this capacity, have the same kind of tendencies of put ting people in boxes as you are speaking, even those who are trying to bring about the change.

I really made a statement, but the hope is that there is a way of the educational society talking to itself sufficiently to know how to talk to the public and maybe you can give me some thoughts.

Is this type of thing a feasible hope that we can gain in the future and if NIE comes in, that this kind of information will reach the public in a right way?

Dr. ALLEN. I hope it will. Here we are really dealing in symbols. I think for NIE to succeed, it is going to have to have a balance of short-range and long-range programs. There are a lot of issues that are long-range reserve issues that will take 20 or 30 years to find out.

If that is all NIE does it will never make it. There are other kinds of things where we can get immediate payoff.

Simple things like reoriented vocational opportunities, for example. To allow immediately the establishment of some alternatives, and if you will, to mandate the need to evaluate those alternatives in real times, so you get the benefit of establishing something new at the same time as you get benefit then of evaluating what is going on.

To do this I think we may have to change completely the notion of the order of magnitude of funds necessary for evaluation. In a paper appended to my testimony, I suggest that we may need evaluation and funds that equal or surpass the program funds.

In other words, if we are trying to evaluate something in real time, that is a task and a half. We have technology now that suggests that we might be able to do this in terms of computer retrieval of data and so forth.

But it may be an enormous effort. I would like to see some exciting alternatives developed that would be symbolic in terms of being highly visible, very exciting, give people hope in a way that they have not had hope before, and then tie to those an evaluative effort that would be of equal magnitude or larger magnitude so you start getting evaluative evidence at the same time you are implementing the program rather than waiting until the program is at an end and then evaluate it.

I think that is an extremely important kind of strategy.

The other thing is that we fool each other about the fact that you can't change education because they won't let you and where you say "they," fill in the blank anyone you want.

Teachers say that they can't do it because administrators won't let them or the public won't let them or PTA or Congress won't let them. One of the worst things you could do to an educator is take away all of his excuses because I am not sure he could produce on anything at that moment.

I am not being pejorative of colleagues in education because I think that is also true of myself. The point being that somehow, again I come back to the word alternatives and experiments, there is an image that the public won't let you experiment with kids.

The standard thing. You can't experiment with kids. They are too poor. You can experiment with dogs but not kids. The best answer to that comes from my good friend Madeline Hunter at UCLA when she says before she was director of laboratory school at UCLA she was a rat psychologist.

She said, "When you say that I cannot experiment with kids, I resent that as a rat psychologist but when I experiment with rats, my rats are very well taken care of."

When you experiment with kids you provide more resources, you monitor carefully, and you take obligation for something when it goes wrong, kids who are experimented with are lucky kids. You look at some of the experiments we have in education, Parkway project in Philadelphia or Metro project in Chicago or any of the alternative school notions, and they are oversubscribed.

Hundreds or thousands of children apply to get into a Parkway school where they don't have the foggiest notion of what it is going to be like.

It is only the hope it is something different from what now goes on. If you take that and put it in perspective, the conservatism with which we go about education reform is unwarranted.

I don't want to mandate that we have to throw everything out in education because I would not be able to get away with it. If I could I would like to because we could not make it much worse.

Instead we could invent mechanisms where a certain percentage of students could be shifted over to experimental programs with an option that every year or two a larger percentage could be added until we gain equilibrium between demands for option and the options which exist.

I think you get two benefits. One would be benefits of options themselves in letting people out from under a system that they don't respect.

I think that is a very important benefit. Even more important, once you create competition within educational scenes that is going to shape up the establishment because right now there is no mechanism whereby anyone gains any respectable accountability.

That is a big word in education these days. It is hard to understand what it means. I am afraid if it means performance that we may put undue focus on those objectives which are easily measurable rather than some of the other things that may be more important in my judgment.

I think we have to find new mechanisms for accountability. One of the best mechansims is to have alternative programs coexist where the marketplace becomes the evaluative mechanism of accountability.

Mr. PEYSER. Thank you, Mr. Chairman.

Mr. BRADEMAS. Dean Allen, I have been very impressed by your response to the questions of both Mr. Reid and Mr. Peyser, and I will just put one related question to you. As I understand it, you make the case that we must give much more attention in the kind of educational research that we undertake, to its implementation and dissemination, both for substantive reasons, and I press a step further, to the question that I put to Dr. Bailey, namely, the importance of persuading practicing politicians like us that it is worthwhile. I say this because if we don't see any change coming out of research, even though we may be

impressed by the observation you just made that anything is better than what is, that is not always a persuasive argument in this kind of institution.

You may be able to make that case logically but not necessarily be able to do so politically.

Having said that, I would ask you to comment on two or three points. You decried university-based research but you were decrying university-based research not because it was based in universities but because it was not related to the real world out there. What about the problem of which Mr. Reid spoke at one point in his questions the problem of basic research into the learning process? You did not touch on that very much.

Third, what further comments can you give us on possible relationships in the research field between the universities and the schools? How can we get university people like yourself into more direct concrete dialog and coexistence and interchange with a given school system?

Dr. ALLEN. If I may take the last one first, one of the most important problems in education today is inservice teacher education.

I think that inservice teacher education is a real scandal. You bring teachers back once a year and you inservice them, or 4:30 on Thursday afternoon they go into an inservice kind of mechanism.

Now if it is true that schools need to be radically changed, then the teachers have to find some legitimacy in terms of the way in which they can participate in the change. We can't write off a whole generation of teachers. Here is where the university has to stop defining the basis of inservice education or the basis of education in some theoretical model, and has to come and relate not only to what is there because hopefully we are trying to change what is there, but to relate to how you get to there from here.

In other words, to join partners with the schools in mounting programs of school reform. One model, for example, that we are attempting to inaugurate at the University of Massachusetts is where we may find a series of school districts that would be willing to embark on a 3-year program with the university.

The first year, the university and school district jointly explores ways in which the program would change substantially. The second year the university and school would work jointly to develop the logistic support and ability to implement such programs.

And the third year the university sticks around to take some responsibility to implement the program of reform. In the process of that 3-year period study, you could base your inservice teacher education and your preservice teacher education out in the schools.

So this would be another way of building a bridge between the university and school district. It may very well be that you would bring disciplinary scholars into the schools. Here one of the problems is not the lack of willingness of schools to listen to disciplinary scholars but there are no brownie points for disciplinary scholars to do that.

Their points are for research and education. To get them involved in programs of practical educational reform at other levels is just outside the purview of current university practice. If you are going to really take seriously the development of new relationships between

universities and schools, you have to redefine the award systems in the universities and in the schools.

One of the things that has to come in here is the fact that we have to find a way, and this is one of my standard chivarees, for differentiated staffing. Until we have elementary and secondary teachers who are as highly paid and with as much responsibility as university professors, we are never going to be able to bridge the hiatus between university and elementary and secondary school level.

That means you have to break the back of the salary level. You have to have the potential for some teachers at the 40 or 50 thousand dollar level. If you handle elementary and secondary level that had professional status of university scholars and legitimately for that status, then you could get them involved in university programs and you start breaking down the stream ot watertight compartments between the different levels of education.

I think this would also encourage more community involvement and the community might begin service as a bridge between universities and schools.

In terms of the idea of university based research, I think one of the real problems in American education is that no one has figured out how university based research is to be funded. The States are unwilling to take basic funding responsibility for graduate education.

I know in the School of Education at the University of Massachusetts, $2 out of every $3 I spend are not State dollars. They are foundation and Federal dollars rather than State dollars.

The primary burden of graduate research comes institutionally. This means it becomes a soft money operation subsequent to the vagaries of programs being developed or killed.

One of the reasons that universities are in the difficulty they are in now is that all of a sudden you have withdrawal of substantial programs simultaneously without other programs being developed to take up the slack.

So I think that first of all we have to find the mechanism to put graduate education and research in the university and on a much more regularized basis.

Then I think in exchange for that, because the funding mechanism is one of the major mechanisms to command program change, in exchange for that I think that we ought to reorient the programs of university research so that instead of being exclusively oriented to disciplines, they become oriented to the problems of society.

In other words that sociologists, anthropologists and psychologists will become members of a national faculty.

At the institutional level we should have institutes on man and environment and other problematic problems in society. If that happens, then you have a way to compel scholars to devote major parts of their energies to university based research that has more immediate pay off in society.

The trade off for that would be hopefully the ability of those scholars to have a portion of their resources available for basic disciplinary research. In other words, I am willing to support a faculty member at the university for about one-third of his time to do anything that he pleases as a scholar.

I think I should have responsibility to provide him the funds for that in exchange for which, about two-thirds of the time he should

do the bidding of the institution and bidding of the clientele of the university of which he is a part.

We have not tended to find ways to create that kind of a balance. I think it is the same issue the second question you ask, Mr. Chairman, in terms of basic research. I think we will get the support of the community for basic research and their tolerance for basic research and patience for that if we also mount concommitant programs of research efforts which have more immediate payoffs and create more immediate symbols.

What we desperately need in education is the equivalent of the symbol of the moon shot, something we can focus all of our attention on that becomes immediately obvious both what the goal is and how the things we are doing relate to that goal.

As a byproduct we will then gain the leeway and acceptability and political reality to mount programs of basic research which will provide the matrix for the next generation of implementation.

Mr. BRADEMAS. Thank you very much, Dean Allen. I know we can sit here for several more hours talking to you and Dr. Oettinger and Dr. Bailey, but we do not have the luxury of that amount of time. I hope, however, with respect to our other witnesses, you will allow our subcommittee to call on you later on for continued advice and counsel.

You have been helpful to us this morning. The subcommittee is adjourned.

(Whereupon, at 11:50 a.m. the subcommittee adjourned subject to call of the Chair.)

TO ESTABLISH A NATIONAL INSTITUTE OF EDUCATION

WEDNESDAY, MARCH 17, 1971

House of Representatives,
Select Subcommittee on Education
of the Committee on Education and Labor,
Washington, D.C.

The Select Subcommittee on Education met, pursuant to call, at 2:10 p.m., in room 2175, Rayburn House Office Building, Hon. John Brademas (chairman of the select subcommittee) presiding.

Present: Representatives Brademas, Reid, Bell, Landgrebe, Hansen, Peyser, Scheuer, and Grasso.

Staff: Jack Duncan, counsel, David Lloyd-Jones, staff, Martin LaVor, minority legislative associate, Gladys Walker, clerk, Christina Orth, assistant clerk.

Mr. Brademas. The subcommittee will come to order. We are meeting this afternoon to hear testimony of several distinguished administration officials, the distinguished Secretary of Health, Education, and Welfare, Mr. Richardson; and his distinguished colleagues, Sidney Marland, U.S. Commissioner of Education; the Deputy Commissioner of HEW for Development, John Ottina; and the Deputy Assistant Secretary for Education Legislation, Christopher T. Cross.

These gentlemen have come to testify today on legislation which seems to me to be of the highest importance for the future of American education, legislation designed to implement President Nixon's proposal to create a National Institute of Education. As the President said in his speech on educational reform of March 3, 1970, the NIE is intended as an organization to serve as a focal point both for carrying out and for supporting research, demonstration, development, and innovation in American education.

As President Nixon said in that address. "As a first step toward reform we need a coherent approach towards research and experimentation."

Speaking for myself, and I think I don't misstate the views of the other members of this subcommittee, the proposal of President Nixon to establish a National Institute of Education is one of the most thoughtful and constructive initiatives in the field of education that I must say I as a member of this committee for 12 years, have heard voiced by an American President.

I for one want to commend the President on this initiative. Indeed, some of us on this subcommittee today may be stronger supporters of his proposal than he is. This is why the subcommittee has been holding hearings, inviting a number of experts in education and in the field of educational research and development and innovations and why we are considering this proposal in such depth.

The Chair just wants to make two or three other quick observations before inviting the Secretary to testify. It seems to me that there are several conditions that are very important if the National Institute of Education is to be more than cosmetics, if it is really to make a serious and substantive impact for change and improvement in education in our country.

First, I think it would be most foolish if we were to underfund the National Institute of Education. Time after time members of our committee have been told of the disappointments with the Regional Education Laboratories and that disappointment has largely been attributed to the inadequate nature of their funding.

I would hope very much that the administration will, by the money that it recommends for the programs to be carried out under the NIE, make clear that it is serious about the NIE.

Having spent the last several days traveling around universities in the Midwest where I heard much hope for the NIE voiced by educators, I make this point even more strongly.

Second, I would hope that those who are responsible for administering the NIE and carrying out programs under it will be balancing considerations of the long run extension of knowledge against the immediate needs of society. It would seem to me the NIE ought to be concerned both with learning more about the learning process with very pressing, urgent, immediate problems in education.

Third, I would hope—and perhaps this admonition is addressed to Members of Congress—that we do not expect results from our investment in research too readily and rapidly. I hope we will get away from the slot machine mentality that too many of us in Congress have who think that if you put a research nickel in on Monday you will get a quarter's worth of results out on Friday.

Research in education, as in other areas, takes time.

I hope as well that the research that will be carried out under the NIE will make a real difference. One of the reasons education research meets such a cold reception on Capitol Hill is that many Members of Congress don't really think it makes any difference.

We have the preconception that research in education is up there in the clouds someplace and that it is not really translated into the schools, the teachers, the students, and the universities. So we hope that research carried out under the NIE will be directed toward serious substantial real world problems.

Moreover, I believe it should be said that if the NIE is to succeed, it must emphasize excellence, that it is no place for mediocrity, no place for second rate or slovenly work.

Finally, let me express my own view that the NIE will include persons from disciplines not always thought of as being embraced within education—anthropology, cypernetics, biochemistry—to cite only a few. For we are coming to learn that these disciplines also have an impact on how people teach and learn and should therefore be called into the process supported by the NIE.

I hope the Chair will be forgiven for this expression of his own views on this matter. I want to reiterate, gentlemen, how strongly I feel about the importance of this enterprise—to repeat, one of the most encouraging ventures I have seen recommended by an American President in the field of education.

Mr. Secretary, we welcome you. We look forward to hearing your statement. Then I understand that Commissioner Marland will be highlighting his testimony and then we can put questions to you.

We are glad to have you, sir.

STATEMENT OF HON. ELLIOT RICHARDSON, SECRETARY, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE; ACCOMPANIED BY HON. SIDNEY P. MARLAND, JR., COMMISSIONER OF EDUCATION; DR. JOHN OTTINA, DEPUTY COMMISSIONER OF DEVELOPMENT; AND CHRISTOPHER CROSS, ACTING DEPUTY ASSISTANT SECRETARY FOR LEGISLATION

Secretary RICHARDSON. Thank you very much, Mr. Chairman, members of the subcommittee, the Chair has very succinctly, and I am sure the Commissioner and I would agree, very persuasively stated already the considerations underlying the President's proposal for a National Institute of Education. I think we would associate ourselves with all of the objectives that you have just summarized.

From that point of view, therefore, perhaps it could be said that my testimony and the Commissioner's amount in effect to preaching to the converted.

On the other hand we will at least be laying a foundation on which questioning can proceed and perhaps supplementing in slightly different perspective some of the points you have already made.

Mr. BRADEMAS. Allow me to interrupt at that point Mr. Secretary. I just want to make an observation. Our subcommittee plans to go into the NIE in considerable depth, as I think you may know, and one of the reasons I at least feel very strongly, that we need to do so is that although we on the subcommittee may be to some extent converted to the importance of educational research but we still really don't know as much as we should about educational research. If, therefore, we simply were to rush through action on this bill without giving it the attention that it merits, we will be missing a great opportunity to educate ourselves on this committee and our colleagues in Congress on this and we may pass the bill but you won't get any money out of the appropriations committee.

Secretary RICHARDSON. I think the point you make is very well taken Mr. Chairman, and the hearings and the record made in the hearings will be of value to us in the Department of HEW and the Office of Education as well as I am sure to all people in the United States who are interested in the field of education in general and the development of research capability within that field as well.

As you pointed out earlier, Mr. Chairman, President Nixon did call for the creation of the National Institute of Education as the driving force in a national effort of educational revitalization. The President declared:

> As a first step toward reform, we need a coherent approach to research and experimentation * * * the purpose of the National Institute of Education would be to begin the serious, systematic search for new knowledge needed to make educational opportunity truly equal.

For the schools that have served so well for so long have come into days of serious difficulties—difficulties no one has yet found tools

to resolve. The dimensions of this crisis in educational experience are truly sobering. We have poured billions of Federal dollars into education, only to find that the situation seems more critical than before.

Each year a heartbreaking number of disadvantaged young people leave school without the basic skills needed to fill any but the most menial jobs. There is no assurance that their younger brothers and sisters will do better.

Older people with years of productive labor find themselves in a market which no longer needs their skills and with no adequate system for reeduction and renewal.

Too often creativity and curiosity are stifled, persistence and motivation lost, because we do not know how to build a learning environment which responds to the kaleidoscopic effects of modern society.

The schools are attacked as a symbol of repression rather than honored as places which serve the student's hopes. Violence against teachers and against other students reveals an emotional wilderness in the minds of our young. Incidents of violence initiate spirals of security measures which turn the school from a community center into a daytime prison.

Even the best of schools don't prepare our children to deal constructively with an ever-changing world. We have not yet found ways to teach coping with chance. Or humanity. Or ingenuity.

In the face of these difficulties, we can be sure of one thing: the old answers no longer work. Where once we put faith in the power of a new school building, an extra teacher, a new textbook, we now know that such improvements just don't seem to make much difference. Where once we supposed that careful research would show us the way, we now know that what is proven successful in the laboratory may still prove a failure in the classroom.

Research into the ways that people learn and live, then, is especially critical and especially difficult in this era of change and uncertainty. Traditional techniques and forms will no longer serve; little has yet been found to even replace them.

Promising ideas do abound, but we are coming to appreciate the difficulty of turning them to practice. Complex ideas cannot be marketed so easily as we again market television sets. We know that an innovation may fail because we have not shown teachers how to use it successfully. We know that an innovation may fail because teachers, administrators, or even parents distrust it or dislike it.

We know that an innovation may fail because it involves a mismatch with some other part of school; it does not build on a child's previous experience, or it does not prepare him for subsequent experience, or it is incompatible with other present demands on his time or on school resources.

As a result, fresh and far-reaching educational solutions demand both new knowledge that can be used to reshape those solutions and new ways to put those solutions into practice. These tasks represent educational research and development's most challenging agenda.

Together then with a bipartisan group of Congressmen, we have called for the National Institute of Education to provide fresh leadership in carrying out these tasks. Cosponsored by Congressman Brademas as the subcommittee's chairman, Congressman Quie, and 19

other distinguished members, H.R. 3606 would establish the new agency in HEW as a visible and vigorous focus for educational research and development.

The agency would be separate from the Office of Education, although responsibility for it would be delegated to the Commissioner. Designed to attract scholars of outstanding competence, the NIE would be headed by a presidentially appointed director with special authority to hire and compensate technical and professional staff exempt for certain civil service requirements.

Astute observers have been calling attention to the need for a special educational research and development institution since 1958, when a National Academy of Sciences committee first proposed the agency. The President's Science Advisory Committee repeated the suggestion in 1964.

More recently, both the Commission on Instructional Technology and David Krathwohl, former president of the American Educational Research Association, have come forward with similar ideas.

Through all of these suggestions echoes a common conviction that a new institution would exert greater leadership toward strong educational research and development, and thus toward revitalizing education in America.

For despite our belief that research and development can be the key, we have not supported the major research and development effort needed to tackle our most stubborn and complex educational problems.

In contrast to research and development in other areas of national importance, educational research and development has remained a poor cousin in size, in resources, in scope, and in organization.

In 1968, the man-years devoted to research, development, and innovation in education totaled just 5,390; in health, 59,400.

Only about 10,000 researchers work on education, while the number of researchers working on health is three to five times that figure.

Since 1950 the Nation has invested less than $1 billion in educational research and development; in that time, $7 billion has been devoted to agriculture research and $14 billion to health research. Private industry's research and development investments have been even higher. The electrical equipment industry, for example, spends $4.2 billion a year on research and development; the aircraft industry spends $5.6 billion.

Research and development receives only .3 percent of educational expenditures and 4.6 percent of health expenditures.

I mention research in health, agriculture, and industry, not because their tasks are identical to those of education research—they are not—nor because resources in these areas are sufficient to their needs; certainly there is always a need for new thrusts in these areas of knowledge.

Of course, research in these fields has had the advantage of a strong base in the hard sciences and more easily observable results than educational research.

But the mission of educational research and development is certainly as challenging and complex as that of research in health, in agriculture, in industry. And education research and development clearly lags several orders of magnitude behind.

In addition to problems of size, and insufficient resources, educational research and development has not attracted enough top quality re-

searchers from a broad range of disciplines; it has been approached mainly from the standpoint of educational psychology, testing, administration, and the like.

And research has rested on narrow institutional base; most of it has been conducted on university campuses. Industry, Government, and other institutions carry on very little work in educational research and development.

Finally, we have not established a visible high-level national institution charged with educational research and development management. In part, this failure reflects a general lack of interest in educational research because of its relative weakness, and the lack of educational research and of organizational prestige helps to perpetuate that weakness.

In other fields, high-level agencies devoted solely to research and development have proven extremely successful. In health, for example, nationally visible research efforts have benefited from the establishment of research and development units separate from health operating functions.

In contrast, the National Center for Educational Research and Development has remained a component of the Office of Education. As such, it has not been able to escape some measure of bureaucratic anonymity. While the top Federal management position ranks at a level IV in health research and a level V in agricultural research, NCERD's placement in the Office of Education has kept its head at a GS–17 level.

Creation of a National Institute of Education would address directly this last problem, and it would address indirectly educational research and development's other weak points.

The National Institute of Education would bring greater stature to research and development in education, organize interdisciplinary teams to seek radically new approaches to solve educational problems, and invite the commitment of more resources.

Establishing a new agency will not by itself and all the difficulties facing educational research and development. But a separate research and development institute with special characteristics is needed, if we are to make room for major progress. The changes feasible within existing institutional arrangements simply will not lead to a quantum leap toward excellence in educational experimentation and innovation.

Creating a new agency can, for example, affect the size, scope, and vitality of the educational research community. A National Institute of Education will spark interest in educational research generally. Since education research has traditionally lacked prestige in the academic community, many top scholars have been reluctant to enter it.

As education research gains prestige, outstanding scholars from a wide range of disciplines will become interested in the field.

The National Institute of Education's prominence would be maintained by several key characteristics. First, as I have mentioned, the agency itself would be a distinct unit outside the Office of Education, allowing it visibility as a separate unit.

Second, its Director, as an executive level V, would be a high-level appointee. This ranking is a necessity if we are to recruit a Director with extensive experience and the highest national stature, and to compensate him appropriately.

The Director must command enough respect to draw the very best academicians, educational practitioners, public administrators, and so on, to work in NIE.

Third, the special personnel authority would allow the agency enough high-level positions and freedom to bring in outstanding scholars. Their presence, both permanent and short term, will build an institutional reputation and a high degree of confidence.

Beyond strengthening educational research and development itself, the new Institute would organize people, energies, and resources more effectively to conceive fresh approaches to education. A "critical mass" of expertise from a variety of fields would be marshaled. The National Institute of Education's personnel system will allow special flexibility to gather the best minds and put them to work together. And as a new agency, the National Institute of Education can develop its own operational patterns best suited to a research and development agency.

Finally, the NIE could stimulate the increases in funds for research that we have not yet been able to achieve. Perhaps because of its immaturity as a field, education research has not received the public support needed to secure substantially increased resources.

If the agency does indeed succeed in boosting public interest in educational research and development, a willingness to increase public investment should follow.

In this connection, Mr. Chairman, I can address directly the concern you expressed earlier as the underfunding of the proposed NIE.

I would like to emphasize the President's commitment to a sound and systematic growth of Federal expenditures for educational research and development under the NIE. We would expect NIE's first-year budget to fall within a range of $150 to $200 million. An estimated $120 to $140 million of this represents projected levels of programs to be shifted from the Office of Education. After the first year, we would expect to see NIE's budget rising steadily to a level of $310 to $420 million in fiscal year 1977.

In summary, let me reiterate that renewing education's promise requires new tools and techniques developed by a vigorous research and development system.

The system of educational research and development itself needs strengthening if it is to match that challenge. Prominent researchers from many disciplines must be drawn to the task; funds must be so marshaled to devise imaginative and radically new approaches.

As the next step toward these ends, we must mold a new agency capable of providing energetic national leadership—a National Institute of Education. I urge you to join in support of this move, by acting favorably on the bill before you, at the earliest possible date.

Mr. Chairman, I will now turn the discussion over to Dr. Marland. Although for the reasons I've mentioned we feel it crucial that the National Institute of Education be organizationally distinct from the Office of Education, I also wish to make Dr. Marland responsible for all major efforts in education, including the National Institute of Education.

He speaks today in the broad role of the administration's chief education officer.

Mr. Brademas. We agreed that Dr. Marland would have a chance to summarize and give the highlights of his testimony, and then we would go on with the questioning. Go ahead.

Dr. MARLAND. Thank you, Mr. Chairman, I will, with your permission, submit for the record a statement, and will make a very few highlights from that statement for the benefit of questions that may follow.

The chairman has called attention to the presence of Dr. John Ottina, the Deputy Commissioner, before you today. I would add the name of Dr. Harry Silberman, another new officer in the Office of Education, the chief officer in the present National Center for Educational Research and Development, who unfortunately is ill and unable to be here today.

Dr. Ottina and Dr. Silberman have been members of the Office of Education only for some several weeks. They have had a large hand in the development of the ideas being placed before you today, even though they have been aboard only a short while. I might say this is true of myself.

The important message I intend to convey is that those of us who have come lately to responsible positions in the Office of Education, indeed those who are engaged directly in research and development, give hearty applause to the proposition that they have come to after it has been created by others. There is no question about our commitmitment to the new Institute.

We are now considering the range of options before us, including those suggested in the very valuable report submitted by Dr. Levien of the Rand Corp. It was an extremely useful document as a base for our further planning.

We are forming an internal planning group which will analyze these options and provide the detail for the agency's program and organization, if this proposal is adopted by the Congress. Since this work is still in progress, and since we still have a year of development ahead of us, I hope that the committee will understand that much of our thinking must therefore still be considered tentative. With that caveat, let me share with you a few of the ideas surrounding our present plan.

FUNCTIONS

First, I should like to talk about the Institute's functions. NIE would pursue several broad aims. First, claiming the lion's share of the agency's budget, would be to mobilize the ablest scholars and direct their talents to comprehensive research and development programs to find solutions to education's most serious problems.

Some of these solutions will build on the best current techniques—many will probe radically new approaches to learning. All will lean heavily on development and on the invention of effective means of translating ideas into materials and practices workable—and working—in the field. In any case, the Institute's independent, creative atmosphere and flexible organization will enable its staff to take a hard look at common assumptions and hallowed traditions in the profession of teaching.

Teams of people with different expertise, research and development personnel, educators, teachers, public officials, and so forth, would be organized around basic problems. They would plan research and development programs designed to yield new knowledge, materials, and methods, coordinated to provide powerful leverage on each problem. For example, finding successful approaches to educating the poor might mean supporting a range of projects from basic language

studies to designing alternatives to formal schooling for alienated ghetto teenagers.

Another broad aim of the NIE would be to reinforce the scientific and technological foundation of education, and strengthening the role of pure research techniques. We need to understand better how physical and biological processes affect learning, and we must deepen our scientific understanding of behavioral and social phenomena.

The forces of science must be brought to bear on educational issues; scientists in all disciplines must be encouraged to join the effort. As Secretary Richardson has already noted, the Institute would be particularly well suited to attracting these researchers.

Finally, the Institute would seek to strengthen the educator's capacities in his various roles: as teacher, as chief architect of educational form and content, as a public official responsible to his community. In furthering this cause, NIE might support projects to devise self-evaluation techniques for teachers, to study and reinforce local processes of curriculum development, and to test various accountability mechanisms. It would support projects designed to broaden the concept of teachers to include students themselves, older students, paraprofessionals, parents, and volunteers.

ORGANIZATION AND STAFF

NIE's success in pursuing these aims will depend in part on the way staff are organized to work on them. We are now working to design an organization which would best serve NIE's purposes.

Dr. Levien has proposed a "matrix" model of organization, allowing staff to move between permanent organizational bases and temporary project task forces. His plan conceives of three constituent organizations. One would manage problem-solving programs; one would manage programs to strengthen the scientific base of education and educational practice generally; the third would evaluate the state of education and of public education policies.

This is one possible model: we are currently evaluating it by examining its effectiveness in situations where it has actually been applied. At the same time, we are looking at alternative designs.

However staff are organized, certain personnel patterns characteristic of leading research and development agencies will emerge.

These distinctive patterns will be made possible in large part by the bill's authority to hire and compensate technical and professional staff exempt from civil service classification and compensation regulations.

Distinguished academicians and educators whose permanent career commitment is to a university, school system, or industry could spend a year or so at the NIE. Those with special expertise could join the staff for even shorter periods to work on a single project. In addition, the authority would permit the streamlined hiring procedures particularly suited for short-term, high-level personnel.

RELATIONSHIP TO OTHER AGENCIES AND CLIENTELE

This brings us to NIE's relationship with other agencies and organizations, for the Institute must maintain an active and continuing interchange with a variety of these.

First, NIE's relationships to the Office of Education must be a particularly close one. NIE must be responsive to the role of OE, as the latter serves American education broadly. The Office of Education, on the other hand, must be in a position to help formulate the questions NIE should and would address. Further, OE must support the delivery system for promoting implementation of the practical results of education research and development in the field.

The Commissioner of Education would be responsible for both agencies; Secretary Richardson would delegate responsibility for the NIE to him.

I can say for myself that I would expect to use this strategic position as forcefully as possible to insure that the two agencies complement each other. In addition, there must be a variety of formal and informal mechanisms for easy interchange between OE and NIE staff. I would expect that Office of Education officials would serve on NIE advisory groups, and vice versa. OE staff could be drafted to serve on a short term basis on NIE's problem solving groups. Permanent NIE staff might be required to take temporary assignments in the Office of Education as part of their development.

NIE would assume responsibility for most activities now conducted by the National Center for Educational Research and Development. NIE would assume responsibility, for example, for programs in basic research, ongoing development activities, for the research and development centers and regional education laboratories, research training, and construction of research and development facilities.

The transition can be orderly and systematic, but it must be carefully planned. Preparation would extend through fiscal year 1972. These activities currently carried on by NCERD would very likely be organized differently from the present organization. In addition, OE would retain its responsibility for evaluation and policy-oriented research relating to OE programs and statistical gathering devices. While NIE would be charged with designing new delivery systems for research products, the Office of Education would oversee demonstration and dissemination activities, and support whatever new systems the NIE might develop.

We look to NIE to promote the coordination of education and related research and development activities supported by the various Federal agencies. A number of agencies support research and development activities relating to education as part of their own particular missions, but there has been little effort to coordinate them. NIE would act as a clearinghouse for information on relevant programs. The agency would provide an intellectual meeting ground where personnel of various Government agencies concerned with educational research and development can think together about educational problems, and thus avoid duplication among their own programs.

The Institute would also complement the proposed National Foundation on Higher Education. The Foundation would support exemplary operating programs in post secondary education. While NIE works to devise and test new educational methods, the Foundation will encourage the demonstration and adoption of promising practices in higher education already known.

NIE will deal with broadly based problems and practices, many running throughout all levels of education; the Foundation will focus

on needs and issues particularly to higher education. The same coordination mechanism used to link NIE to the Office of Education would be used with the Foundation: advisory councils, staff exchanges and direction from the Commissioner and so on.

NIE will need a constant and lively interchange with people in a variety of non-Federal agencies and organizations. State agency personnel, local school administrators, independent scholars, school board members, teachers, private and informal education organizations, schools of education, colleges and universities, scientific and professional societies, students—all these and more must be continuously involved in the workings of NIE.

The National Advisory Council on Education Research and Development will be one mechanism for involving outstanding individuals engaged in research and development, education, public affairs. The Council would have 15 members serving staggered 3-year terms. Other mechanisms would be developed to foster a continuous flow of information to NIE, as well as to facilitate the flow of information from NIE through the Office of Education and other channels to the classrooms of the Nation. The exchange of personnel working at the agency on short term projects will also strengthen ties between NIE and the field.

In concluding my formal testimony, Mr. Chairman, I would note that I have dealt briefly with a number of basic issues involved in creating a new agency: its aims, its staffing patterns, its relationship to current programs and other agencies. In all of these areas, our thinking is necessarily exploratory.

Designing this new agency is a complex task. If the NIE is to fulfill its promise, it will call for the ablest organizational talents we can assemble. The basic characteristics of the proposed new agency, its distinct identity, its structure, its stature, its flexibility—create the potential for bold national leadership toward superior educational research and development.

We are shaking off the customs of traditional Government agencies as we construct this new instrument for the improvement of learning.

A National Institute for Education promises new scholarly leadership and excellence in educational research and development. I join Secretary Richardson in urging your support for this new effort.

Thank you.

(Prepared statement of Hon. Elliot L. Richardson and Hon. Sidney P. Marland, Jr., follow:)

PREPARED STATEMENT OF HON. ELLIOT L. RICHARDSON, SECRETARY OF HEALTH, EDUCATION, AND WELFARE

Mr. Chairman and members of the subcommittee, last March, President Nixon called for the creation of the National Institute of Education as the driving force in a national effort of educational revitalization. The President declared, "As a first step toward reform, we need a coherent approach to research and experimentation . . . the purpose of the National Institute of Education would be to begin the serious, systematic search for new knowledge needed to make educational opportunity truly equal."

For the schools that have served so well for so long have come into days of serious difficulties—difficulties no one has yet found tools to resolve. The dimensions of this crisis in educational experience are truly sobering.

We have poured billions of Federal dollars into education, only to find that the situation seems more critical than before.

Each year a heartbreaking number of disadvantaged young people leave school without the basic skills needed to fill any but the most menial jobs. There is no assurance that their younger brothers and sisters will do better.

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The schools are attacked as a symbol of repression rather than honored as places which serve the student's hopes. Violence against teachers and against other students reveals an emotional wilderness in the minds of our young. Incidents of violence initiate spirals of security measures which turn the school from a community center into a day-time prison.

Even the best of schools don't prepare our children to deal constructively with an ever changing world. We have not yet found ways to teach coping with change. Or humanity. Or ingenuity.

In the face of these difficulties, we can be sure of one thing: the old answers no longer work. Where once we put faith in the power of a new school building, an extra teacher, a new textbook; we now know that such "improvements" just don't seem to make much difference. Where once we supposed that careful research would show us the way, we now know that what is proven successful in the laboratory may still prove a failure in the classroom.

Research into the ways that people learn and live, then, is especially critical and especially difficult in this era of change and uncertainty. Traditional techniques and forms will no longer serve; little has yet been found to replace them.

Promising ideas do abound, but we are coming to appreciate the difficulty of turning them to practice. Complex ideas cannot be marketed as easily as we market television sets. We know that an innovation may fail because we haven't shown teachers how to use it successfully. We know that an innovation may fail because teachers, administrators, or even parents distrust it or dislike it. We know that an innovation may fail because it involves a mismatch with some other part of school—it doesn't build on a child's previous experience, or it doesn't prepare him for subsequent experience, or it is incompatible with other present demands on his time or on school resources.

As a result, fresh and far-reaching educational solutions demand both new knowledge that can be used to shape those solutions and new ways to put those solutions into practice. These tasks represent educational research and development's most challenging agenda.

Together with a bipartisan group of Congressmen, we have called for the National Institute of Education to provide fresh leadership in carrying out these tasks. Cosponsored by Congressman Brademas as the subcommittee's chairman, Congressman Quie and 19 other distinguished members, H.R. 3606 would establish the new agency in HEW as a visible and vigorous focus for educational research and development. The agency would be separate from the Office of Education, although responsibility for it would be delegated to the Commissioner. Designed to attract scholars of outstanding competence, the NIE would be headed by a Presidentially appointed director with special authority to hire and compensate technical and professional staff exempt from certain civil service requirements.

Astute observers have been calling attention to the need for a special educational research and development institution since 1958, when a National Academy of Sciences committee first proposed the agency. The President's Science Advisory Committee repeated the suggestion in 1964. More recently, both the Commission on Instructional Technology and David Krathwohl, former President of the American Educational Research Association, have come forward with similar ideas.

Through all these suggestions echoes a common conviction that a new institution would exert greater leadership toward strong educational research and development—and thus toward revitalizing education in America.

For despite our belief that research and development can be the key, we have not supported the major research and development effort needed to tackle our most stubborn and complex educational problems.

In contrast to research and development in other areas of national importance, educational research and development has remained a "poor cousin" in size, in resources, in scope, in organization.

In 1968, the man-years devoted to research, development, and innovation in education totaled just 5,390; in health, 59,400.

Only about 10,000 researchers work in education, while the number of researchers working on health is three to five times that figure.

Since 1950, the Nation has invested less than $1 billion in educational research and development; in that time, $7 billion has been devoted to agriculture research and $14 billion to health research. Private industry's research and development investments have been even higher—the electrical equipment industry, for example, spends $4.2 billion a year on research and development; the aircraft industry spends $5.6 billion.

Research and development receives only .3 percent of educational expenditures—and 4.6 percent of health expenditures.

I mention research in health, agriculture, and industry, not because their tasks are identical to those of education research—they are not—nor because resources in these areas are sufficient to their needs: certainly there is always a need for new thrusts in these areas of knowledge. Of course, research in these fields has had the advantage of a strong base in the hard sciences and more easily observable results than educational research. But the mission of educational research and development is certainly as challenging and complex as that of research in health, in agriculture, or industry. And education research and development clearly lags several orders of magnitude behind.

In addition to problems of size and insufficient resources, educational research and development has not attracted enough top quality researchers from a broad range of disciplines; it has been approached mainly from the standpoint of educational psychology, testing, administration, and the like. And research has rested on a narrow institutional base—most of it has been conducted on university campuses. Industry, government, and other institutions carry on very little work in educational research and development.

Finally, we have not established a visible, high level national institution charged with educational research and development management. In part, this failure reflects a general lack of interest in educational research because of its relative weakness, and the lack of organizational prestige helps to perpetuate that weakness. In other fields, high level agencies devoted solely to research and development have proven extremely successful. In health, for example, nationally visible research efforts have benefitted from the establishment of research and development units separate from health operating functions. In contrast, the National Center for Educational Research and Development has remained a component of the Office of Education. As such, it has not been able to escape some measure of bureaucratic anonymity. While the top Federal management position ranks at a level IV in health research and a level V in agricultural research, NCERD's placement in the Office of Education has kept its head at a GS-17 level.

Creation of a National Institute of Education would address directly this last problem, and it would address indirectly educational research and development's other weak points. The National Institute of Education would bring greater stature to research and development in education, organize interdisciplinary teams to seek radically new approaches to solve educational problems, and invite the commitment of more resources.

Establishing a new agency will not by itself end all the difficulties facing educational research and development. But a separate research and development institute with special characteristics is needed, if we are to make room for major progress. The changes feasible within existing institutional arrangements simply will not lead to a quantum leap toward excellence in educational experimentation and innovation.

Creating a new agency can, for example, affect the size, scope, and vitality of the educational research community. A National Institute of Education will spark interest in educational research generally. Since education research has traditionally lacked prestige in the academic community, many top scholars have been reluctant to enter it. As education research gains in prestige, outstanding scholars from a wide range of disciplines will become interested in the field.

The National Institute of Education's prominence would be maintained by several key characteristics. First, as I have mentioned, the agency itself would be a distinct unit outside the Office of Education, allowing it visibility as a separate entity. Second, its director, as an Executive Level V, would be a high level appointee. This ranking is a necessity if we are to recruit a director with extensive experience and the highest national stature, and to compensate him appropriately.

The director must command enough respect to draw the very best academicians, educational practitioners, public administrators and so on to work in NIE. Third, the special personnel authority would allow the agency enough high level positions and freedom to bring in outstanding scholars. Their presence, both permanent and short-term, will build an institutional reputation and a high degree of confidence.

Beyond strengthening educational research and development itself, the new Institute would organize people, energies and resources more effectively to conceive fresh approaches to education. A "critical mass" of expertise from a variety of fields would be marshalled. The National Institute of Education's personnel system will allow special flexibility to gather the best minds and put them to work together. And as a new agency, the National Institute of Education can develop its own operational patterns best suited to a research and development agency.

Finally, the NIE could stimulate the increases in funds for research that we have not yet been able to achieve. Perhaps because of its immaturity as a field, education research has not received the public support needed to secure substantially increased resources. If the agency does indeed succeed in boosting public interest in educational research and development, a willingness to increase public investment should follow.

I would like to emphasize the President's commitment to a sound and systematic growth of Federal expenditures for educational research and development under the NIE. We would expect NIE's first-year budget to fall within a range of $150 to $200 million. An estimated $120 to $140 million of this represents projected of programs to be shifted from the Office of Education. After the first year, we would expect to see NIE's budget rising steadily to a level of $310 to $420 million in Fiscal Year 1977.

In summary, let me reiterate that renewing education's promise requires new tools and techniques developed by a vigorous research and development system. The system of educational research and development itself needs strengthening if it is to match that challenge. Prominent researchers from many disciplines must be drawn to the task, funds must be marshalled to devise imaginative and radically new approaches.

As the next step toward these ends, we must mold a new agency capable of providing energetic national leadership—a National Institute of Education I urge you to join in support of this move by acting favorably on the bill before you at the earliest possible date.

Mr. Chairman, I will now turn the discussion over to Dr. Marland. Although for the reasons I've mentioned we feel it crucial that the National Institute of Education be organizationally distinct from the Office of Education, I also wish to make Dr. Marland responsible for all major efforts in education, including the National Institute of Education. He speaks today in the broad role of the Administration's chief education officer.

PREPARED STATEMENT OF HON. SIDNEY P. MARLAND, JR., U.S. COMMISSIONER OF EDUCATION

Thank you Mr. Secretary.

Mr. Chairman and members of the subcommittee, I would like to begin by noting that we are in the midst of comprehensive planning for research and development. Ultimately, this complex process will produce a detailed blueprint for the NIE—its organization, staffing, and program. In developing this blueprint, we are working with many expert and knowledgeable individuals through the country. In the initial stage of the planning process, Dr. Roger Levien of the Rand Corporation was asked to direct a study of major issues involved in creating a new educational research and development agency. That study has produced a number of options and recommendations for consideration—concerning major educational problems NIE should tackle, organizational development to deal with these problems, projected funding levels, and so on.

We are now considering the range of options, including those suggested in Dr. Levien's extremely useful document. We are forming an internal planning group, which will analyze these options and devise a detailed first-year agenda for the agency's program and organization. Since this work is still in progress, I hope the Committee will understand that much of our thinking must be considered tentative. With that caveat, let me share with you our general views on how the NIE would operate.

FUNCTIONS

First let me talk about the Institute's functions. The NIE would pursue several broad aims. Its first aim, claiming the lion's share of the agency's budget, would be to mobilize the ablest scholars and direct their talents to comprehensive research and development programs to find solutions to education's most serious problems. Some of these solutions will build on the best current techniques—many will probe radically new aproaches to learning. All will lean heavily on development and on the invention of effective means of translating ideas into materials and practices workable—and working—in the field. In any case, the Institute's independent, creative atmosphere and flexible organization will enable its staff to take a hard look at common assumptions and hallowed traditions in the profession of teaching.

Teams of people with different expertise—research and development personnel, educators, teachers, public officials, etc.—would be organized around basic problems. They would plan research and development programs designed to yield new knowledge, materials and methods—coordinated to provide powerful leverage on each problem. For example, finding successful approaches to educating the poor might mean supporting a range of projects from basic language studies to designing alternatives to formal schooling for alienated ghetto teenagers.

Another broad aim of the NIE would be to reinforce the scientific and technological foundation of education, strengthening the role of pure research techniques. We need to understand better how physical and biological processes affect learning, and we must deepen our scientific understanding of behavioral and social phenomena. The forces of science must be brought to bear on educational issues; scientists in all disciplines must be encouraged to join the effort. As Secretary Richardson has already noted, the Institute would be particularly well suited to attracting these researchers.

Finally, the Institute would seek to strengthen the educator's capacities in his various roles; as teacher, as chief architect of educational form and content, as a public official responsible to his community. In furthering this cause, NIE might support projects to devise self-evaluation techniques for teachers, to study and reinforce local processes of curriculum development, and to test various accountability mechanisms. It would support projects designed to broaden the concept of teachers to include students themselves, older students, paraprofessionals, parents, and volunteers.

ORGANIZATION AND STAFF

NIE's success in pursuing these aims will depend in part on the way staffs are organized to work on them. We are now working to design an organization which would best serve NIE's purposes. Dr. Levien has proposed a "matrix" model of organization, allowing staff to move between permanent organizational bases and temporary project task forces. His plan conceives of three constituents organizations. One would manage problem-solving programs, one would manage programs to strengthen the scientific base of education and educational practice generally, the third would evaluate the state of education and educational practice generally, the third would evaluate the state of education and of public education policies. This is one possible model: we are currently evaluating it by examining its effectiveness in situations where it has actually been applied. At the same time, we are looking at alternative designs. For instance, a "functional" model would move staff among tasks associated with different stages of research and development, from basic research to application in the field. Other models might organize staff around educational objectives, age levels, and so on.

However staff are organized, certain pers nnel patterns characteristic of leading research and development agencies will emerge. These distinctive patterns will be made possible in large part by the bill's authority to hire and compensate technical and professional staff exempt from civil service classification and compensation regulations. This authority, I should stress, will only apply when there is a specific reason to use it—hence most of the staff will be hired under the civil service system. The special authority would not be likely to be used for those engaged in support functions for the agency: budget, personnel, contracts, and so on.

The concept of exemption authority builds upon the experience of other successful research and development institutions, such as NSF and NIH. As these agencies have found, drawing the highest quality staff for research and development re-

quires staffing patterns and compensation levels specially adapted to the career patterns and professional traditions of the scholarly community. Exemption permits, for example, a system of short-term, noncareer appointments. Distinguished academicians and educators whose permanent career commitment is to a university, school system or industry could spend a year or so at the NIE. Those with special expertise could join the staff for even shorter periods to work on a single project. In addition, the authority would permit streamlined hiring procedures particularly suited for short-term, high-level personnel.

RELATIONSHIP TO OTHER AGENCIES AND CLIENTELE

This brings us to NIE's relationship with other agencies and organizations, for the Institute must maintain an active and continuing interchange with a variety of these.

First, NIE's relationship to the Office of Education must be a particularly close one. NIE must be responsive to the role of OE as the latter serves American education broadly. The Office of Education, on the other hand, must be in a position to help formulate the questions NIE would address. Further, OE must support the delivery system for promoting implementation of the practical results of education research and development in the field. The Commissioner of Education would be responsible for both agencies; Secretary Richardson would delegate responsibility for the NIE to him. I can say for myself that I would expect to use this strategic position as forcefully as possible to ensure that the two agencies complement each other. In addition, there must be a variety of formal and informal mechanisms for easy interchange between OE and NIE staff. I would expect that Office of Education officials would serve on NIE advisory groups, and vice versa. OE staff could be drafted to serve on a short-term basis on NIE's problem-solving groups. Permanent NIE staff might be required to take temporary assignments in the Office of Education as part of their development.

NIE would assume responsibility for most activities now conducted by the National Center for Educational Research and Development. NIE would assume responsibility, for example, for programs in basic research, ongoing development activities, the research and development centers and regional education laboratories, research training, and construction of research and development facilities. The transition can be orderly and systematic, but it must be carefully planned; preparation would extend through Fiscal Year 1972. These activities currently carried on by NCERD would very likely be organized differently from the present organization. In addition, OE would retain its responsibility for evaluation and policy-oriented research relating to OE programs, and statistical gathering services. While NIE would be charged with designing new delivery systems for research products, the Office of Education would oversee demonstration and dissemination activities, and support whatever new systems the NIE might develop.

We look to NIE to promote the coordination of education and related research and development activities supported by the various Federal agencies. A number of agencies support research and development activities relating to education as part of their own particular missions, but there has been little effort to coordinate them. NIE would act as a clearinghouse for information on relevant programs. The agency would provide an intellectual meeting ground where personnel of various government agencies concerned with educational research and development can think together about educational problems, and thus avoid duplication among their own programs.

The Institute would also complement the proposed National Foundation on Higher Education. The Foundation would support exemplary operating programs in post-secondary education. While NIE works to devise and test new educational methods, the Foundation will encourage the demonstration and adoption of promising practices in higher education already known. NIE will deal with broadly based problems and practices, many running throughout all levels of education; the Foundation will focus on needs and issues particular to higher education. The same coordination mechanisms used to link NIE to the Office of Education would be used with the Foundation: advisory councils, staff exchanges, direction from the Commissioner, and so on.

NIE will need a constant and lively interchange with people in a variety of non-Federal agencies and organizations. State agency personnel, local school administrators, independent scholars, school board members, teachers, private and informal education organizations, schools of education, colleges and uni-

versities, scientific and professional societies, students—all these and more must be continuously involved in the workings of NIE.

The National Advisory Council on Education Research and Development will be one mechanism for involving outstanding individuals engaged in research and development, education, public affairs. The Council would have 15 members serving staggered 3-year terms. Other mechanisms would be developed to foster a continuous flow of information to NIE, as well as to facilitate the flow of information from NIE through the Office of Education and other channels to the classrooms of the Nation. The exchange of personnel working at the agency on short-term projects will also strengthen ties between NIE and the field.

In concluding my formal testimony here, Mr. Chairman, I would note that I have dealt briefly with a number of basic issues involved in creating a new agency: its aims, its staffing patterns, its relationship to current programs and other agencies. In all of these areas, our thinking is necessarily exploratory.

Designing this new agency is a complex task. If the NIE is to fulfill its promise, it will call for the ablest organizational talents we can assemble. The basic characteristics of the proposed new agency—its distinct identity, its stature, its flexibility—create the potential for bold national leadership toward superior educational research and development. We are shaking off the traditions and customs of historic government agencies as we construct this new instrument for the improvement of learning. In our planning, we are searching for a design that best capitalizes upon the experiences of like agencies and developing criteria to use in evaluating NIE's effectiveness on an ongoing basis. A National Institute for Education promises new scholarly leadership and excellence in educational research and development. I join Secretary Richardson in urging your support for this new effort.

Thank you.

Mr. BRADEMAS. Let me start by asking a question about a matter to which both of you made reference, that is the relationship between the Office of Education and the NIE. I had a letter this morning from a very distinguished leader of American education commenting on precisely that issue. Without getting into who he is, let me say that he clearly indicated grave apprehensions about the point that you both have made and which is represented, Dr. Marland, by your line on page 5 that NIE must be responsive to the role of the Office of Education as the latter serves American education broadly.

My correspondent remarked that, on the contrary, NIE must be able to spit in the eye of the Office of Education. I must say that my instinct is to think that he is quite right, and you will understand that that observation has nothing to do with the present distinguished occupant of that Office.

I am rather apprehensive that anybody who is serious about American education is going to take seriously the NIE if it is thought to be a captive of the Office of Education. I put my case only with slight hyperbole to get a response from you.

That is a rather significant question.

Dr. MARLAND. I welcome the chance to respond to that, Mr. Chairman. Following your comment, I would say depending on how the wind is blowing the Office of Education often spits in its own face.

Quite seriously, I would say that we are perhaps at this time our most enthusiastic critics. If there is any question about our ability to engage in self-criticism and to find a way to make this new institution which as the Secretary has said must be wholly autonomous from the Office of Education a service to the children of this country without being a servant of the Office of Education, I would say that the very structure of the new agency itself will make that workable.

Mr. BRADEMAS. I appreciate that response. I would just observe that I think there is a lot to be said for the separation of powers system.

I believe in original sin and, therefore, in not trusting anybody too much in these matters. I hope this is an issue that we can elaborate on again as we get on through the hearings because you have given us, I think, an expression of hope, more than a justification.

Dr. MARLAND. I did not wish to prolong my reply. I sensed that the chairman was not looking for a lengthy reply. If you do wish to have this subject developed at length, I will be pleased to do so.

Secretary RICHARDSON. I would like to have a word, Mr. Chairman, on this point. I think the issue is basic to the need for more effective leadership at the national level in the field of education, most broadly.

I think it is fair to say that the question you put and the comments of your correspondent reflect, essentially, an attitude toward the U.S. Office of Education which itself is the paramount objective of my administration and the Department of HEW and Commissioner Marland's administration in the Office of Education to change.

I do not think, therefore, the question of location and role of the NIE in the relationship between the Director of NIE and the Commissioner of Education should be addressed as if it were impossible to infuse any new leadership, new energy into the Office of Education itself.

I think that the Commissioner has quite pungently understood and underscored the point that this is his objective and it is an objective he is carrying out through the exercise of rigorous self-criticism, as the necessary first step toward internal reform of the Office itself.

I might add finally that it was my objective in seeking a new Commissioner of Education, shortly upon my own arrival at HEW to find an indvidual who could both move in innovative directions and lead others in the field of education to follow him in those directions.

It would have been comparatively easy to find an innovator with no knowledge or a man so close to the field of education that he was unable to see the need for any innovations.

I think in Commissioner Marland we have a man who has both the capacity to lead and also the capacity to see the necessity for new directions. I think given that kind of role in leadership in the Office of Education itself at least important that the NIE be related to it closely enough so that innovative ideas are effectively transmitted into practice and so that the questions and needs arising out of the system of education, its own awareness of the necessity for change can present questions to the NIE.

So the only remaining issue then is how do you position the two in such a way that this symbiotic relationship is maximally reinforced.

Mr. BRADEMAS. Could I turn to another question, gentlemen, on which you have given your comments, and that is the degree of genuine commitment on the part of the administration?

I am somewhat confused by the budget estimates before me. I have two documents that say that appropriations for 1971 programs to be under the auspices of the NIE will total $131,862,000, and that there is a request for fiscal year 1972 of $160,655,000 for these programs. Then there is another document that has come from HEW that indicates that in 1971, there was appropriated to be, under the auspices of NIE, $131,626,000; and that for 1972, the request is $118,550,000. But in your testimony submitted prior to your oral statement, you estimated that the 1972 budget request for programs under the NIE would be somewhere between $140 and $150 million.

So I am not quite clear at this stage of the proceedings how much money you are proposing to expend for programs to be administered through the NIE and an obviously related question is how much of that is to be new money that would not have, as it were, found a place under the programs that you propose to transfer?

Secretary RICHARDSON. Let me make a couple of preliminary comments, Mr. Chairman, and then I will ask Commissioner Marland to complete our response to these questions.

First of all, there has been some variance in figures used from time to time that reflects ongoing discussions of the question of just which research or research related programs should be transferred to the NIE.

Beyond that there has been a good deal of thought given to the order of magnitude of new money that ought to be made available to it in the first year.

Our present thinking is that the total of that amount of the new programs in the 1972 budget that would be transferred is $118 million and that it would also have in that year additional funds of the order of $30 to $60 million.

Dr. MARLAND. The explanation is quite appropriately called for by the chairman. As we have sharpened our planning and refined our figures since submitting our earlier document to the committee, Mr. Chairman, we have made some adjustments which do need explanation.

Mr. BRADEMAS. May I say that I hope in response you will have in mind the disparity between the amounts of money that you propose and the programs that you propose to be transferred.

I ask this because in your March 17 study, the proposed tentative budget for NIE, you have for example, under curriculum development in vocational education the figure of $4 million. But then one turns to your more recently submitted document entitled, "OE research and development programs," and sees the columns, "likely to be transferred to NIE," and there observes that you have lumped all vocational research together and have asked for $55.7 million.

In like fashion, in the earlier document, you refer to handicapped research $30,350,000, while in your subsequent document, you have a little over $8 million. Now you may be comparing apples and oranges, and obviously I am not interested in misrepresenting what you are doing but I do think you ought to give us a clearer picture of what it is you are proposing to do.

Dr. MARLAND. As I say, we have continued to refine and sharpen this planning. Indeed I am sure we will for some months to come. We are giving you today's calculations, and I believe they are reasonably sound, I will explain the difference between this and the earlier estimates.

First, if I may however, I would like to turn to the charts just for a moment, since I am now on my feet, to return to the question which the chairman asked as to how the arrangements for authority and responsibility might flow between the Office of Education and NIE.

I think it is important to point out that NIE is not a part of the Office of Education. The NIE would report to the Commissioner, to whom the Secretary would delegate overall responsibility for the agency. It would have its own advisory council. The Office of Education sits here. You have met today D. John Ottina who sits here as a component of that Office.

Likewise the Foundation for Higher Education would be detached and separated from that Office and still within spitting distance. Turning to the question of funds, in our present plans for the Institute we are now projecting a level of funding in those functions which are suitably transferrable to NIE from the present Office of Education. That is a figure of $118 million to which the chairman referred. That is the point here on this chart for our fiscal year 1972 as now budgeted.

As we move through 1972, which will be the planning year, you note that there is a $3 million sum for planning during that year. This means the initial assembly of a staff, the beginning of the program, the beginning of the gathering of consultants during this first year.

You will note here the range of $150 to $200 million representing the first operational year after the year of planning. A year later it is $280 to $340 million, in that range.

So on through the years. Projecting to 1977, we have an estimated range of $310 to $420 million. Roughly, 10 percent of that or less, as we now perceive it, is devoted to inhouse research by the community of scholars there gathered. The rest of it performed under contract by scholars outside of the National Institute of Education, much after the fashion of the National Institutes of Health.

Returning to the question as to the variance in figures which we have provided to date, let us take, for example, your question on the funds for research and development effecting the handicapped. Here you have an ongoing program in the Office of Education, and a lively discussion as to where best to place the research element of that office.

But we have in our own best judgment now divided the moneys dedicated to research and development for the handicapped into two parts. That part which is clearly not strictly research but rather the development of new materials, for example, the production of films for the deaf, has not been cataloged as research. We would more truthfully catalog it as development, as demonstration, loosely cataloged in the past and funded under the research authority. You will note in our latest report that we are declaring for 1972, a level of something over $7 million of the total sum to be held in the Office of Education. Some $8 million would be moved to the new NIE budget, since it is strictly research and development. That is one of the later refinements in our proposal.

Mr. BRADEMAS. If we are going to hear Dr. Levien on Tuesday, I wonder if it would be possible for you, Mr. Commissioner, to let us hear from the persons in your office who are heading up these several research programs to be transferred.

Dr. MARLAND. We will welcome this opportunity, Mr. Chairman, and we will have them here at your call.

Mr. BRADEMAS. It will probably be Tuesday.

Mr. Reid?

Mr. REID. Thank you. Mr. Chairman.

Mr. Secretary, I would like to welcome you here most warmly today, and along with Commissioner Marland and Dr. Ottina and Mr. Cross. I would say that I for one greatly welcome the President's initiative on NIE that you are so clearly supporting today for NIE.

I might ask if you could give us a little fuller definition of the difference between NIE and the foundation and the broad range of endeavors each would undertake.

Secretary RICHARDSON. I would be very glad to do that. Mr. Marland may wish to add to it or to subtract from my reply.

Most fundamentally and simply stated the National Institute for Education is charged with the support and research, the seeking for new knowledge, in effect, across the whole range of education.

The National Foundation we conceive of as an institution providing funds for the support of reform directed budgets within institutions of higher education. The Foundation's objective is not in the first instance or primarily new knowledge. It is to encourage and support the undertakings of institutions of higher education that wish to move in new directions.

The direction in which they move may have been pioneered already by others or they may represent the application in practice of a new knowledge that has been gained through research.

So fundamentally, therefore, the National Foundation would seek out opportunities in higher education and review projects submitted to it that are directed toward reform and innovation while the NIE would conduct research and development activities throughout education, elementary, secondary, and higher education as well.

Mr. REID. NIE would be concerned with a coherent approach to research and experimentation across the board from preschool through higher and graduate education, and research here would mean research in the pure sense, development, demonstration, innovation testing, et cetera?

Secretary RICHARDSON. Yes; I would just add to that research training is a related activity. Yes; that is a good brief statement of the range that the NIE would cover.

Mr. REID. Thank you.

Second, could you respond a little more explicitly on the dissemination of that function of the research once it was developed by NIE?

Secretary RICHARDSON. Yes, again the Commissioner may want to comment on this. I think very clearly a great lack to this date in the research and development role of the Office of Education, and I think it is fair to say of practically every agency in HEW, has been the lack of follow through in translating new knowledge into practice.

There is a need, therefore, strictly from the research and developmental side, to focus on the question of how to disseminate new knowledge and get it moved into practice.

This would be an area we visualize as appropriate for the NIE itself to focus on. In other words, how to translate into practice the knowledge that it helps to bring into being.

Meanwhile, however, the Office of Education itself must have a major role in dissemination. Indeed, we regard the relationship of the Office of Education to the State departments and local educational systems as being increasingly a relationship in which people from the Office of Education are bringing to bear, in contact with the educational administrators and teachers what has been learned elsewhere through research and development.

We visualize, in other words, increasingly a role for the Office of Education in which it exercises leadership through that kind of communication.

We think that as we have multiplied Federal formula grants programs that we have reduced the leverage of that device in accomplishing a response by the educational system to identifiable national interests.

We think we should therefore find means of encouraging State and local school systems to establish objectives and to bring to bear means of measuring their own progress toward these objectives.

We think that the role of the Federal Government in relationship to that process should increasingly be to bring to their attention what other people have done successfully or what the research or demonstration process, lead largely by NIE, has discovered. So, there can be no sharp line between the dissemination role of the NIE and that of the Office of Education, but primarily the emphasis with the NIE would be on the development of the new techniques and approaches to the dissemination process. The role of the Office of Education would be the actual provision of information, technical assistance, and help in bringing new practice into the delivery system itself.

Mr. Reid. Thank you, Mr. Secretary.

Dr. Marland. I can be very brief and if I can, I will return to the chart, Mr. Reid. As the Secretary has indicated, the Office of Education will indeed support the delivery system. Inventions, the discoveries, and the creative work must happen here, in NIE. This institution, the laboratory, if you will, will reach out to test its ideas, to develop models that will work.

But then this institution must have access to a delivery system which it does not have. It is not the nature of scholars to get into the marketplace and produce the product and deliver it and put it in place. That is the job of the operating agencies.

The reason for placing responsibility for supporting the delivery system in the Office of Education is to make use of that network and access to the 19,000 school districts which the agency has already established.

Mr. Reid. Thank you, Mr. Marland.

Mr. Secretary, on page 2 of your testimony I think you said we have not yet found ways to teach coping with change or humanity or ingenuity. In the face of these difficulties we can be sure of one thing, the old answer is no longer working.

Would you care to comment briefly about what seems to me to be a central question here, the importance of totally new and imaginative research, not just an assessment of old ways and past pedgogic concepts or even some of the newer ones of compensatory education, but some really imaginary research striking out in many directions to really deal with the question of how to make education work which in so many sectors of our society clearly is not working.

Dr. Marland. I think you have well stated, Mr. Reid, the urgency and importance of what we think is needed. I think we see this in school systems everywhere. It is a feeling reflected by administrators and teachers as well as by parents and pupils: the sense that something better is needed, that the old answers of larger per pupil expenditures or smaller class size or better equipment do not themselves produce better education.

For example, in the field of compensatory education, even though title I has pumped substantial additional amounts of money into the system, it seems clear that the trial and error process has not given us the answer of how to overcome educational handicaps from a disadvantaged environment. And so with respect generally to underachievement and alienation among poor children, we need to know more about what it is that sparks their interest in learning and involves them in the educational process.

We have problems of unemployability among young people leaving school at all levels who are unprepared to get or to fill a decent job. We need to understand more about the processes that move institutions themselves internally, to change and adapt and meet new needs. There is a long list of things one might identify.

Mr. REID. Wouldn't you add to that much greater emphasis on preschool or early learning, day care centers and approaches of this kind in the range of perhaps from ages 1 to 4, much greater emphasis here than we have given?

It seems that a good deal of research indicates that much of the learning takes place between 1 and 4. Isn't preschool an area we have to stress, early learning?

Dr. MARLAND. Yes, I think this is true now in at least two broad aspects. One is the development of better approaches to the educational process itself for preschool children. The other is the larger organizational setting within which preschool education takes place. As you know, of course, through the legislation on which you and other members of this committee have been working, there are significant jurisdictional and organizational questions to be solved in the development of stronger preschool educational systems and the relationship between the school system itself and support of day care under other agencies.

These are questions that can be and I think should be addressed by the NIE in seeking to develop model approaches. There is also the whole question of educational technology, the role of television, for example. We need a better and deeper understanding of Sesame Street and other such approaches: why they work, what parts of them appear to be most effective, and how they can be adopted and so on.

Mr. REID. Thank you very much, Mr. Chairman.

Mr. BRADEMAS. Mr. Bell.

Mr. BELL. Thank you, Mr. Chairman. I would first like to applaud you, Mr. Secretary and Dr. Marland, in your approach to this problem. I think it is a program that is long overdue, a very important one.

I am not being particularly partisan about this; I think all administrations have an inclination to throw money into an educational area without any really strong forethought, planning, or analysis.

Although I certainly supported the Elementary and Secondary Education Act when it first came out, I think we could have given a great deal more thought about the direction in which it was oriented.

I certainly do commend this. I think you are moving in the right direction. As I understand it, Commissioner, the R. & D. basically will then come under NIE?

Dr. MARLAND. That is correct.

Mr. BELL. Then as I see it, OE will be eased gradually into a little less importance, if I may put it that way, and NIE into greater im-

portance; this, of course, would particularly be true if the revenue sharing program were to go through and so on.

Dr. MARLAND. I would differ with that, Congressman Bell. If you will give me a moment I will tell you why. I would have to hold that the Office of Education, historically the center of education in the United States, will not only remain important but will increase in importance with the very presence of NIE.

The Office of Education over the years has increasingly been engaged by mandates of Congress in a system of managing money more than of exercising national leadership in education. A combination of categorical constraints implicit in the law, very limited numbers of people, swiftly increasing mandated programs and dollars, has so overwhelmed the Office of Education with merely the process of paper management that the role of leadership has been virtually impossible.

We now have an opportunity between the Office of Education under, special revenue sharing and the National Institute of Education, to free the people in the Office of Education to perform the role that they were intended to perform: namely, to exercise national leadership through technical assistance, persuasion, initiative, delivery products, out in the field, working cheek by jowl there with the people who desparately need help and are now asking for it.

We will have in the NIE a fountainhead of new and useful knowledge. It won't support the shallow kinds of research that we have been more or less compelled to undertake in years past because of a lack of scholars and money.

Now we will begin to have a system that I believe I again can assure this committee will have some very workable components. Both agencies will be stronger for it if these two actions—creation of NIE and passage of special revenue sharing—materialize.

Mr. BELL. Thank you.

I am glad our disagreement allowed you to make that statement. I think it is an astute observation. I assume that you will cover such matters as research in the areas of textbooks and the areas of tests and so forth? Through your NIE?

I note that at UCLA, which is in my district, they have a program being worked on from the Office of Education which studies the testing and the programs for children throughout the various parts of the State.

They analyze this very thoroughly to try to find out and come up with the best way of testing children. I suppose that under this new program this would come under NIE; is this correct?

Dr. MARLAND. It would indeed.

I would like to introduce Dr. John Ottina who will describe the way our laboratories would relate to NIE.

Mr. OTTINA. Congressman, all of the centers and the laboratories we now have in existence would form one of the strongest arms of the NIE and would be under their responsibility. The particular one I think you are referring to is the center which is developing individualized testing approaches in order to gain understanding of where that particular child is and help him in his place in school.

I think it is characteristic of the trend of activities of individualized approach instruction.

Mr. BELL. I appreciate that very much. I think that is progress in the right direction. One concern I have in this particular area is the

fact that in some of our schools there is a kind of willy-nilly approach to this problem. I think some schools in California are depending too heavily upon the writers and sellers of the textbooks to decide just what their children are going to learn, and what direction they should move toward.

I am not criticizing the textbook business, but I don't believe they should have the sole authority to dictate policy. This is a concern to me as I think there should at least be some other factor involved in the choice of textbooks. If we in the Federal Government can be influenced to develop that same kind of leadership in a local government, that would be a factor here. I think that would be important.

Do you agree?

Dr. MARLAND. I would, indeed. I would add California is one State where there is a State system of textbook approval and therefore some tendency to centralize on a limited number of resources for instruction.

On the other hand, I am sure this is a very enlightened State. I am sure many of its teachers and administrators are departing, as they should, from the textbook as the sole source for learning or for curriculum planning.

I think there will be many things used as a basis for learning in addition to textbooks, developed through the influence of NIE and its arms, such as the Center at UCLA. We should not overlook the influence, as the Secretary says, of new technology yet to be discovered in ways to expedite learning, to increase the productivity of teachers. Let us not set aside the computer and the interface with classroom communications systems to the computer for teaching and learning. Particularly we will be looking for ways to use television far more richly than we have yet used it in the classroom. These really are things that go beyond the textbook. I agree with you the textbook still remains the fundamental tool for learning and we will continue to respect it.

Mr. BELL. What other areas of research do you expect to be the highest on the agenda in NIE?

Dr. MARLAND. I am sure my bias creeps into this as a school administrator and as now Commissioner of Education. I would say first that the priorities should be influenced heavily by the counsel of scholars who will be named to be the advisory council to NIE in terms of its policy formulations.

But I would hold that today one of the great and overwhelming problems of this country is the fact that children in inner cities, children of deprivation in rural areas, children of minority components of our society simply are not learning well enough.

We must confront that problem and solve it. I know of no other way than through dignified responsible hard-nosed research pouring out whatever treasury it takes to solve that problem and then to move the solution into the field fast.

Mr. BELL. I might suggest in a rather facetious vein that perhaps the NIE should take on the job of studying and researching the problem of how our categorical aids through our commission are being handled. Perhaps NIE could straighten out some of the tackle lines that have forced some local administrators to write 10 sheets of paper before starting to do any work on the problems at hand.

Dr. MARLAND. I would be pleased to recite my earlier statement on the subject of the President's proposal for revenue sharing. Suffice it

to say the Office of Education is now charged with administering 79 laws and 107 different programs and for 1972, $6.9 billion.

I would have to say each time a law passed that Congress in its wisdom did what it should have done and it was right. But we now find ourselves with more than we can handle sufficiently and more than the local situation can tolerate.

Mr. BRADEMAS. I may say to my friend from California that although I have been moved and indeed touched by the Commissioner's expression of hope that the NIE and special revenue sharing would allow you to get greater leadership in the field of education, that you might be able to do so even if you get only the NIE.

Mr. Landgrebe.

Mr. LANDGREBE. Thank you, Mr. Chairman.

Mr. Richardson, Mr. Marland just stated a moment ago that we obviously have some serious problems in education in America and I certainly agree with that.

Just permit me three observations: One observation is that we are lacking in discipline. Also I feel lacking in just overall spirit of discipline and we have too many choices or alternates in the classroom. Boys and girls can graduate from high school today with really having studied any of those subjects that are basic in preparation for life.

My third observation, already stated under testimony here today, is the fact that while education is receiving a substantially larger share of our gross national product than it was in 1940, we do have a critical situation in education.

So with those three brief observations I would like to ask a couple of questions. No. 1, it was remarked or stated here that we would attract scholars of outstanding competence who would be exempt from certain civil service requirements.

Could you tell us briefly what some of those requirements might be that would be waived in the case of an educator?

Secretary RICHARDSON. May I respond first, Mr. Chairman? Mr. Landgrebe, the basic problem here is the problem of qualifying individuals under civil service competitively for a particular slot which then in effect brings him into the career service and which in turn attaches at that point various restrictions.

The kind of freedom that is needed here is the freedom to bring a scholar who has been doing work at his own university to Washington to be a part of the NIE community so that he can continue work in a field in which he is interested, but in a new setting and with new relationships to people who are interested in a similar field of inquiry.

It would be possible to give him something short of a permanent appointment; it might be understood that after a year or two he would go back to his own university. It would make it possible to hire, without regard to the rigid supergrade allocation by the Civil Service Commission among agencies, since there would be no fixed grade levels among these positions.

In short, it is a matter of trying to achieve a greater degree of flexibility.

Dr. MARLAND. I would add a footnote to that if I might. I have recently gone through the process of endeavoring to engage scholars for the Office of Education and I count that I have been reasonably successful with such men as Mr. Ottina at my right.

But there are not a great many men willing to commit their lives for an unknown period of time to government without the assurance of a beginning and an end and the freedom to behave as independent scholars in that environment. Of the many people with whom I have conversed over the past 4 months in assembling a staff for the Office of Education I have ad infinitum heard, "Marland, I would do anything for you on a short-term basis, consultant, even work free. If you want my help I will give it to you, but I don't want to give up my tenure at the University of wherever." These are rare people, people who are rich resources to this land. They are the kind of people who are not ready to accustom themselves to a life in government.

We would envision in the NIE something not unlike the Brookings Institute; an environment for the free search of ideas, the gathering of scholars in such an environment, the coming and going of scholars without the normal restraints of government, and finally a way to move in and out gracefully and to retain their work and even retain their credentials at their work, be it industry or education.

Mr. LANDGREBE. What can this institute do that you could not do in the Office of Education with considerably more money and funds available?

Isn't it possible for us to get these waivers of Civil Service requirements, thereby making it possible to do this work as part of the Office of Education?

In other words, couldn't we simply expand your research department rather than set up this new department?

Dr. Marland.

Dr. MARLAND. I would be pleased to try to answer that, Mr. Landgrebe. I do feel strongly this distinction between NIE and the Office of Education is a real one.

There is no way, for example, to increase the stature of our center for educational research and development within the Office of Education to the level of an NIE. NIE will enjoy the visibility of a separate agency and the leadership of a level 5 director. This would be a substantial post, recognized as a Presidential appointment, confirmed by Congress, and therefore a person of very high national profile gathering around him the people necessary to the task.

Another advantage of the NIE is its capacity to conduct intramural research. Our present National Center for Research and Development has no power to do this. As you indicate, this might be corrected by law.

But you are still dealing with one bureau within an office that contains some 15 different bureaus. No matter how able a man may be, his visibility with the community we are serving is necessarily kept to a minimum. He reports to the Commissioner of Education perhaps through two or three layers of necessary governmental arrangements. This is the nature of government organization, I fear, and I am becoming accustomed to living with it.

Frequently, researchers are reluctant to leave their research to do other work for a period of time. NIE would enable them to do so, which we would not have the freedom to do even under the best of conditions now.

Mr. BELL. Isn't your position on this question somewhat similar to the illustration you gave a few moments ago about Doctor Levien, who

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worked for Rand Corp.; under those auspices he can be paid a salary for Rand Corp. that he could not be under a governmental position?

Dr. MARLAND. I would have to say that is true, but we can't afford very many Rand contracts at that level.

Mr. BELL. At a certain level you could attract a type of person, a person of ability—like Rand Corp. appeals to high-quality scientists.

Dr. MARLAND. This is precisely what NIE would be able to do and it would have the resources to do it. I would have to say our present circumstances in terms of the convention of Government and the restraints of budget and the interplay between bureaus necessarily constrains our research and development activity. These very real liabilities which would be much more easily overcome, I believe, in an autonomous agency with a budget of its own. One would have to say that there has been a long history of bad relations between the Office of Education now, with its limited resources and visibility and the researchers in the field who in many cases are not responsive to our appeals for assistance from them.

I think NIE would have the autonomy and the prestige, the high profile, comparable if you will to the National Institutes of Health as it serves the industry of medicine, the profession of medicine.

There is a very real difference between a bureau within a large structure and the freedom and autonomy of a separate agency.

Mr. LANDGREBE. This director would be a Presidential appointment. Did I understand you right that he would therefore not be under the control of the Department of HEW, and would answer only to the President of the United States?

Dr. MARLAND. No; I think we should make that clear. The Secretary's testimony pointed out under this proposed law NIE will be created as an instrument of HEW, accountable to the Secretary. The Secretary in turn will delegate to the Commissioner of Education the authority to oversee NIE, that is to that extent NIE will report through the Commissioner to the Secretary.

There will be a director appointed by the President, not by the Commissioner nor even by the Secretary. This will be for a high degree of autonomy. I would suspect the Commissioner's influence on NIE must be that of a collegial relationship. There must be a spirit of good will and lateral exchange between those officers, but I would see them as being necessary to each other if the system is to work.

Mr. LANDGREBE. I have one final question. Page 7 of the secretary's report states that certain programs, presently under HEW and costing an estimated $120 to $140 million would be transferred to NIE.

Is this a firm decision?

At least one other witness stated that in his opinion, NIE would not replace any of the present programs but would increase our overall expenditure for education.

Here it is estimated that there will be a substantial amount of programs presently under the Office of Education that can and will be shifted to the new institute.

Now lets have a little bit further strong comment on that.

Dr. MARLAND. Very good, Mr. Landgrebe. I will try to detail what those components of the existing Office of Education are that we now contemplate to be shifting to NIE. Funds for these would come to about $118 million for fiscal year 1972. These components are now broadly in

the R. & D. area. First is the research and development which includes educational research at $7½ million; developmental activity at $9 million; institutional support referred to by Dr. Ottina as the labs and centers, $34 million; libraries and technology research, $3 million; training of research personnel, $4 million; experimental schools, a new component this year, $15 million; planning and evaluation, $1 million; dissemination of research, that is the delivery system, printing, publication, working with the Office of Education on moving materials out, $550,000; vocational research, placing a very high priority at this time under the Secretary's mandates and my own intentions, $35 million for 1972; and returning again to the subject of the educationally handicapped for research and demonstration activities, $8.3 million and for physical education research, $150,000. This does indeed come to the $118 million as indicated on the chart for our 1972 projections, that being the year of transition.

During that same year you will recall that we have requested $3 million for the formulation of the beginning year of NIE. These activities that I have been describing are carried out in the Office of Education now, many of them in what we call NCERD.

Correspondingly, there would be perhaps seven or eight functions of the Office of Education which would remain there, which are not truly R. & D. activities. I took note of one illustration at the request of the chairman. Some parts of research for the educationally handicapped, which are indeed not strictly research, would remain in the Office of Education—the other parts would move. Statistics, a very important part of our office now included under the broad banner of research and development would necessarily remain in the office. This includes both the gathering of nacional statistics and the dissemination of those statistics. They would be a very valuable tool for NIE. NIE would draw heavily upon the talents and technology of our center for statistics in the Office of Education. Conversely, many of the things happening in NIE would influence our behavior in the Office of Education.

Mr. LANDGREBE. I don't see how I can ever hope to get a more concise, detailed answer. I thank you very much, very kindly.

Mr. BRADEMAS. Mr. Hansen.

Mr. HANSEN. Thank you, Mr. Chairman. I will join my colleagues in extending to all of you a very warm welcome with our sincere appreciation for your assistance in developing this legislation.

It seems obvious from our experience thus far that we are going to have a continued colloquy as we are in the process of refining the kind of legislative vehicle needed to do the job.

Reference was made to some of the priority areas of educational research. I was much interested in the commissioner's comment about the kinds of problems that we do deal with additionally and with some determination. I gather from other comments, particularly those by the Secretary, and I would ask this as a question, if you both agree that among the high-priority areas where we need some answers is that of early childhood education, early childhood development? Would you include this as one of the high-priority areas of research?

Dr. MARLAND. I would indeed, Mr. Hansen. We are now engaged in some of this very kind of research. One of our centers that Dr. Ottina has referred to is a center for the study of early childhood education.

We are attempting to learn at what age a child can truly begin to learn skills as well as other knowledge that relate to child growth and development, including health and social relationships, family relationships, and so on. We know there is much to be learned, we know that the crust has been broken. We have learned enough to satisfy ourselves that children can learn in the earliest years; they may be the most influential in terms of his intellectual development. There was a time and it was not so very long ago that even the ablest scientists in and surrounding education would caution us that we should not introduce cognitive learning even at the kindergarten level. We are now setting those ideas aside in the light of scientific evidence to the contrary. There was a time not long ago when we quite seriously believed that the IQ was indeed something fixed at birth.

We know now and in the last several years we are beginning to learn the IQ indeed is influenced by the environment and the human surroundings in which a child finds himself in those early years.

So all I can say is there is much to be learned about early childhood education and much to be learned about higher education, much to be learned about graduate study.

May I add a small word here, Mr. Hansen, which bears on the location of the National Institute of Education within the Department of HEW? It is of critical importance that NIE be established on a footing and develop relationships with other research activities that make as certain as possible that these efforts are complimentary and not overlapping or competitive. There is within HEW, for example, as one of the National Institutes of Health, the National Institute of Child Health and Development. The National Institutes of Health are doing a great deal of important fundamental work on the mechanisms of the brain itself, what is thought, what is memory, and of course this kind of research is basic to the cognitive process and relevant therefore to the kinds of inquiries that will be taking place within NIE.

The Office of Child Development of HEW draws on the National Institute of Child Health and Development and also directly funds research on child development. I think it should. But what the National Institutes of Health do, and what NIE does should be done with a clear working relationship and communication with each other.

I would say that perhaps the most important role of a department like HEW and the role of the Office of Secretary in the Department is to try to assure that these activities are brought into such a relationship that they are mutually reinforced. Certainly this is the way in which we would want the NIE to conduct its responsibilities.

Mr HANSEN. Let me say I welcome your emphasis at that point because it seems to me this has to be a major objective in the design of the NIE, that is to permit us to tap sources of other work in the area.

For example, you mentioned health, in the area of nutrition, other related areas that are relevant to this whole learning process. This seems to me to be one of the major handicaps that much of our research is suffering from at the present time.

Let me go to the other end of the scale. We tend to focus on the high priority items. What steps would you anticipate taking to protect some of the lesser priority items, at least those that don't have the same broad constituency and that are now receiving some help from the categorical research programs.

Handicapped research was mentioned, vocational education, any others, how are we going to protect those that are important?

Dr. MARLAND. I will be pleased to try to respond to that, Mr. Hansen. Historically over the years researchers have been individual, fairly isolated people in education. Each one has tended to pick up the thing he was most interested in and pursue it, Montessori with the little ones, and so on, with various others over the years focusing on a very narrow front.

We see NIE as doing precisely what you have pointed out—namely we don't depend solely upon the scholars with a fairly narrow idea. We as a society would say the big issue confronting this country, let us say, is career education: what is going to happen to the child between the ages of 14 and 22 in terms of equipping him for a full life without necessarily going to college, and indeed should a large number of young people go to college at all? What is the new world of career education to be, what are the needs, what are the projections of our economy, our environment, our business life, that will call for the numbers of people to satisfy those needs and the kinds of training they will require? There are no great scholars at the moment preoccupied exclusively, as Montessori might have been with 4-year-olds, with the career of toolmakers and diemakers and data processing techniques.

That is what we hope to encourage; a new community of scholars engaged in the real needs of education, from early childhood through the graduate school.

What about the areas of inquiry that don't have major public support or constituency groups pushing them? The NIE would have the benefit of an advisory group and leadership internally which should be identifying areas of inquiry in terms of their intrinsic importance and not simply in terms of their felt importance. The strength of the NIE will derive considerably from its stature and from the stature of its advisers. Thus in effect it should be in a position to chart courses on the basis of an objective assessment of their relative importance.

Mr. HANSEN. You have made reference in your testimony again to the advisory role. Could you expand somewhat on your conception of the role of the National Advisory Council?

Dr. MARLAND. Why don't I proceed with that first? The proposed pattern draws on the experience we have had with the National Institutes of Health, which are organized very much in this way. Each has an advisory council, one in the National Cancer Institute, for example, or the National Heart Institute or the Child Development Institute I referred to a while ago. Each has an advisory council of about two-thirds scientists with a special interest in the field of the Institute's responsibility and the other third people with a general interest in it.

The Council serves the primary responsibility of helping to develop policy for research by that Institute. By policy I mean the identification of areas of relative priority, advice as to how to proceed in expanding research in these areas, whether, for example, on an individual unsolicited project basis or through targeted contract research.

The Advisory Committee could in addition help to evaluate for the director and his associates the relative quality of work that has been done.

So the result of this system, in effect, is the ability to draw on the wisest sources of advice in development of the program and in the

evaluation of its quality. Perhaps Dr. Ottina who has had a lot of experience in the actual administration of research, would like to supplement my statement.

Dr. OTTINA. I would hope in setting up this Council that we would try to involve the broad spectrum of people asked for, coming not only from eminent positions in education but eminent positions in other sciences and related fields. We should draw into it the whole spectrum of disciplines that may be involved in pushing our understanding of education and also hopefully bring in people who have had experience in the conduct of research and development from other areas to help us guide what is now the very early and primitive field of educational research. I believe we can learn a great deal from a body so composed. I would see it encompassing this very broad range of people.

Dr. MARLAND. I would add a footnote to the observation that it is indeed still a primitive art and science, this business of educational research.

Until Congress passed a law which created the opportunity and the resources for educational research you could count on two hands the substantial people in the Nation who had really begun to attack this issue. This is now a very swift flowing field. The nucleus of education researchers does still rest in universities with some distinguished people in the Office of Education, but we have to draw many, many more such people into education research. There must be research at the local level and the State level just as in medicine there has to be a network of people who speak the same language and are engaged in the same pursuits.

Mr. HANSEN. I have one final question. With respect to each of the existing programs under OE that are proposed to become a part of NIE, do you have or can you develop the kind of a continuing mechanism for study of these programs that can, as we move forward with this legislation, identify the extent to which they will be continued in their present form, cut back, terminated, or phased out or redirected in some fashion?

Dr. MARLAND. If I understand the question correctly, if I may rephrase it, it is in what ways do we see the Office of Education continuing some programs that are now there, transferring some to NIE and sustaining others in the Office of Education?

Mr. HANSEN. Maybe I should clarify further. With respect to each of those that is proposed to go into the NIE I think we will need from you as we move forward your decision with respect to what is going to happen to that program. Is it going to come in and remain as it is? in some cases I presume programs will be cut back, expanded or transformed. I think we will need to have that kind of continuing input.

Dr. MARLAND. I follow you now, are you asking about what happens after the NIE is in place?

Mr. HANSEN. That is right or as you are carrying on your continuing review of the programs that will become a part of NIE.

Dr. MARLAND. This is where our planning comes in to being, where we cut those programs off that are not bearing fruit and plant new ones. Much of this review is going on now in the transition process.

I will ask Dr. Ottina then to carry forward with that.

Dr. Ottina. Mr. Hansen, if I understand your question correctly, part of what we are asking for is in the next few months to go through each of the many, many programs that we have throughout the Office and examine them for that very purpose.

There are programs which I am sure you recognize have changed from last year, and have changed from the year before though they still may carry essentially the same title and the same categories. Programs do change over time and will continue, hopefully to change over time because that is the nature of the animal we are dealing with.

In the next few months our focus will become sharper and sharper and we will indeed have that list you asked for in detail. We will be able to have this more meaningful dialog with you on precisely which ones we hope will grow and which ones we see phasing out and new ones replacing.

Mr. Hansen. I assume that will be made available to the committee on a continuing basis.

Dr. Ottina. Certainly on a continuing basis.

Mr. Brademas. I would like to put a couple of more questions, if I may, while we have you here, gentlemen. You said, Mr. Secretary, in your testimony, that we are spending about three-tenths of the 1 percent of our educational expenditures on research and development. As I recall from other information the amount of annual educational expenditures with respect to which this percentage refers is $65 billion. You indicated in your testimony that by fiscal year 1977, you propose to be expending through the NIE, therefore I take it the analogous figure, although I am not sure that is correct, $430 million.

What I am trying to get at is the proper analog for fiscal 1977 of the three-tenths of a percent. Now I realize that the $65 billion is my figure, but I think I am right in saying that it probably refers to expenditures in this country on education, and that three-tenths of a percent may allude to all expenditures on R. & D. for education.

Therefore, the $430 million that you propose for the NIE does not represent for fiscal 1977 projections the totality of R. & D. expenditures for education. What I am try to get at—you probably don't have it now—is the projected percentage of total expenditures on education in fiscal 1977 to be represented by research and development.

Dr. Ottina. We would be glad to supply that, Mr. Chairman. Of course, in the interval between now or the first year of operations and the NIE and 1977 the percentage would not begin to approach the relative percentage in other areas simply because the rate at which expenditures increase through the NIE would have to be influenced by the availability of researchers interested in the field, and it would have to be a rate of progress consistent with sound growth.

In development of the figures you have, we have assumed an annual rate of increase in NIE expenditures of about 20 percent. The 20 percent figure itself is drawn from experience with other research support efforts indicating that is about as high as you can go and still achieve sound growth.

I think it is fair to assume in any event that the relative share of governmental support of educational research would be higher at the end of the period than it is now even though there has been some growth outside the Federal role, too.

Mr. BRADEMAS. I was interested to hear you indicate, Mr. Secretary, in your response to Mr. Reid's questions, that the NIE would carry out research across the board from preschool through graduate school, touching every level of American education. I recall your efforts to delineate the distinctions between the proposed foundation for higher education and the National Institute of Education, and I think you know from our earlier conversations that we have had a hard time understanding your rationale on this.

I know we will be getting into it tomorrow in another subcommittee in another context. But let me, if my notes are not inaccurate, read back to you, Mr. Secretary, some of what both you and Commissioner Marland have said here today.

You will appreciate why I still remain somewhat befuddled in my efforts to understand what you are trying to tell us.

You said, I think, with respect to the foundation, Mr. Secretary, that it would not be seeking new knowledge but that its direction would be pointed to what you call the application of new knowledge that has been gained through research.

Then you went ahead to speak a little later in colloquy in response to questions about dissemination and you talked of the importance of dissemination as an instrument for translating the results of research and development into practice, to use your phrase and you said, "this is an area appropriate for the NIE to focus on;" in other words, you said, "how to get the research into practice."

I hope now that you have heard me read back some of your words that you understand why I still have a difficult time understanding the sharp delineation that you have sought—in my judgment totally unsuccessfully—to draw between research on the one hand, and its application, on the other. I really am very concerned about a thread that has run through your testimony again today which seeks, as I view it, to erect walls between basic research, on the one hand, and the application of research results, on the other.

Mr. Marland made the same point when he stood up in front of a chart and said, if I do not misrepresent you, Commissioner—I have no desire to misrepresent you, I have only a desire to understand you—you poured cold water on the suggestion that NIE would have a delivery system, and you used a phrase that I am sure will come to haunt you; you said, "It is not the nature of scholars to get into the marketplace and produce the product and deliver it and put it in place."

I hear what you gentlemen are saying but I have a hard time believing that you really believe it. That distinction just does not make sense to me as I go out and talk to people in schools, as I talk to people on college campuses. I can't really believe that Dr. Ottina, who is a professional educational researcher, wants us to think, nor do I really believe that you think in your hearts that there is this almost metaphysical wall between the research over here on one side and the practice over here on this side.

Now I raise this question at this point. Let's not even get into the Foundation for Higher Education for a minute, let's just put that issue to one side, although it happens to incarnate the general problem I am really trying to get at.

I don't understand how you are conceptualizing the NIE with respect to its research, demonstration, experimentation, innovation, dissemination, application activities.

I said at the outset of my remarks that, again just speaking as one member of this subcommittee, I think one reason educational research is so much criticized in Congress, aside from the fact that most of us very often don't know what it is, and aside from the fact that we don't spend much money on it so it is hard for us to know what it is. But even putting these considerations to one side, we are very, very concerned, and I don't think I misrepresent the views of colleges on both sides of the aisle, that somebody in the backroom is doing "educational research" and that its results never get into the system of education.

Surely you must have heard this criticism everywhere you go in this country. Therefore, when you come in and, in trying to describe the NIE, draw these sharp lines between research, on the one hand and demonstration on the other you are undermining our best efforts to develop in Congress understanding of, and support for educational research.

Now I have preached my sermon and maybe you can enlighten me. I am just trying to understand where you are going.

Secretary RICHARDSON. May I respond to that first, Mr. Chairman. I think in the first place we can distinguish, and your own exposition does distinguish, the development of new knowledge and its translation into practice.

Now it should follow therefore that we can be clear on one point, namely that we can investigate in the National Institute of Education a primary role in the development of new knowledge. We can define this as a central function of the NIE, whatever else it may or may not do.

At the other end of the spectrum I think we can recognize that a major role, and in my view in the future the major role of the U.S. Office of Education should be to exercise leadership in bringing better practice into our school system all across the country.

Indeed, it is impossible to identify any significant Federal role in educational practices. All our grant-in-aid programs have been devils holding out carrots to school systems to develop and improve their programs of teaching in mathematics or counseling and guidance or foreign languages or whatever. I was one of the architects and probably had more to do with the National Defense Education Act from beginning to end than any single individual.

Mr. BRADEMAS. If you will allow me to interrupt. Mr. Secretary, I don't think it is accurate to say that all of these grant-in-aid programs are designed to improve practices. Perhaps ideally they should have been but I can point to you a number of Federal grant programs for education which do not have improvement of education as their principal thrust and were not represented as having that purpose.

That is not the purpose of the impacted aid program. Maybe it ought to be, but it is not.

Secretary RICHARDSON. That is the only program I can think of offhand that does not have that function. Otherwise, there is no point in doing anything under a categorical program. You might as well just

turn the money over to the State and local school systems for education, unless you are trying to develop a better response to an identified need.

In many cases this is a somewhat subsidiary need. The point is that whether there are programs or functions in the use of money under categorical formula grants other than for the stimulation of better responses to an identified need, none the less the role then of the U.S. Office of Education has been and should increasingly be to provide leadership.

Now what does that mean? It means to me, at least, seeking to encourage and to assist State and local school systems to do a better job. Doing a better job will in most instances mean to translate into practice better ways of doing things, things that have not been learned through the R. & D. process, whether they involve the teaching of reading or the career education or better approaches to child development or any and all of these things. It follows, it seems to me, therefore that there is a clear function for the NIE in the development of new knowledge and there is a clear role for the OE in the stimulation and encouragement of better practices and there is a gradation in between and the question you have raised essentially is where does the line fall?

My earlier answer was, to Mr. Reid, to the effect that where dissemination is concerned the role for the NIE, as I would visualize it, is in the development of better ways of translating new knowledge into practice.

Mr. BRADEMAS. That is what you said.

Secretary RICHARDSON. I can visualize a man who has contributed to the better approach to the teaching of reading, for example, might become so interested in translating this into practice that he might want to drop his research in order to get this method more widely adopted.

At that point I would visualize him transferring his own time and energy in NIE to the Office of Education. Assuming that this man has made a real contribution to teaching reading, he again may go on to do more basic research. We ought to have in the Office of Education working out of our regional offices under the regional commissioners people who can go out into the field and explain why this is a good system.

They should not be, in effect, telling the school systems, you have to do it this way. But, they have to try to help make sure they know about it and why it does work well and what data that have been developed and its evaluation of testing and so on show.

Increasingly, it seems to me that this should be the role of Office of Education people in providing technical assistance and information. I think it should be the role of people throughout the Department working with the deliverers of services.

So granted that there is a continuous spectrum from new knowledge through dissemination to application, this is true of lots of activities which none the less require some subdivision of responsibilities as between one person or one institution and another.

As to the distinctions between the NIE and the Foundation, I would repeat that we visualize the Foundation as having a distinguishable function. It is not a function that could not be carried out by the NIE. It is a function we think can be better carried out by another agency,

whose focus is on reform in higher education, not so much from the point of new knowledge, but from the people who want to put change in effect.

I would commend to you, Mr. Chairman, and members of the committee, the Newman report which we issued the other day and which deals with many of the areas in which change is needed in higher education.

Most of the changes are changes that could be accomplished by putting into effect things that are already known. What is needed is, one, an institution of higher education whose administration and faculty want to do something that would respond to one of these identified needs or deficiencies, and two, the financial support available to get it done. This we conceive of essentially as the role responsibility of the Foundation.

There is a distinction also in that a foundation whose function was to support and encourage reform in higher education could do a better job as a separate entity than could the NIE with a focus on the development of new knowledge in the whole range of education.

It becomes simply a question of judgment as to which way to do it. We think it can be better done as we propose than if the two were merged.

Mr. BRADEMAS. I heard what you are saying and I am very discouraged to hear you say it. Dr. Ottina, I just think you're really headed for throwing the most profound cold water on this whole National Institute of Education idea by erecting what I have a hard time thinking any self-respecting professional educational researcher would agree with, namely, the kinds of walls that I hear you are building.

Secretary RICHARDSON. Mr. Chairman, there are no walls proposed here. If you are suggesting that the NIE should absorb total Federal responsibility for education——

Mr. BRADEMAS. Where did I say that, Mr. Secretary? I have tried to have a calm, rational dialog with you, Mr. Secretary, I think you will agree. I have not been trying to be provocative. If you want to make the assertion that in any point in my question I have been so outrageous as to have said what you just said I said, that the NIE should absorb total Federal responsibility for education, then we might as well forget having hearings.

Secretary RICHARDSON. Mr. Chairman, I though I had very clearly indicated that there was at least a distinction and I thought you had acquiesced in it, between the role and responsibility of the Office of Education in the encouragement and support of better practices in the field of education on the one side and for the development of new knowledge on the other.

If one visualizes any distinction of function, whatever, between the NIE and the Office of Education, that is to use your term, to erect a wall, I don't see it as a wall.

So, if you visualize the NIE as having anything less than total responsibility for all Federal functions in the field of education, then it follows there must be some delineation of the role of the NIE.

If that is a wall, so be it.

Mr. BRADEMAS. That, of course, goes without saying. That is only to state the obvious. I am not trying to badger you, Mr. Secretary, I am trying to make a good faith effort as an enthusiastic proponent

of this institute, which I think you know I am, simply to understand it.

I think anybody who knows anything about American education and about educational research and innovation will agree that the kind of questions I have been putting to you are the kinds of questions that serious people who deal with this matter in serious ways ask.

I have just spent the weekend talking to six university deans at one of the largest State universities in the United States. They are very much concerned and have raised with me the same kinds of questions that I have been trying to put to you.

Now if I have given offense, I apologize.

I simply have not yet got clear in my thick Hoosier mind the kinds of distinctions that you have been drawing between basic research and applied research, and dissemination of the fruits of that research into the system. And to make my points, I have just been reading back to your own remarks of colloquy.

Dr. Ottina, maybe you can straighten me out on this and lower the level in here just a little bit. I just want to get a picture of how you see research, demonstration, innovation, and change in our system of education operating through the NIE. That is all I want.

Dr. OTTINA. Yes.

Mr. BRADEMAS. Otherwise there is no point in having public hearings on this proposal. This is why we are here, to get answers to such questions.

Dr. OTTINA. Let me try a little bit. I am sure what we are all understanding in the process is that it is continual. At one end of the continuum it looks like research, at the other end it looks like dissemination. At various times during this process the emphasis changes. At the beginning of the process the person that is involved is trying to understand and find out what is going on, he is not actively engaged in telling people what he has found because he has found very little to start with. At the tail end, when he believes that he has found it, he is out spreading that word or the word needs to be spread. In the interim, you may have a delay.

What impresses me is that we are dealing with many, many people who need to know what has transpired. What impresses me is we do have a system out there of school systems and State educational agencies, all of which are involved in the process of trying to change their schools in their locales. I find it hard to imagine that a researcher or a group of researchers have natural contacts with all of the administrators that are involved. On the other hand, I think it is a natural association for the Office of Education, which has these contacts in its contact with these people. This process cannot be done in isolation of the researcher. He must be involved in it and he of course will be involved in it.

Mr. BRADEMAS. How do you regard the place of demonstration and experimentation and differentiation of the fruits of research in the overall picture?

Dr. OTTINA. Demonstration is again perhaps a difficult word to cope with. The NIE must and will, I am sure, have contact with this world. It must have real children to deal with in real school systems and in the environment they are accustomed to living in and must

use these as part of their development and experimental program. I would not call that a demonstration, I would call it an experiment. It is for the purpose of finding out whether this method or technique does work and if so how it works.

The Office of Education would be encouraging local school districts and State agencies to take these things and facilitate their adaptation in their environment.

Mr. BRADEMAS. Doesn't the network, or what is left of it, of regional education laboratories have as its objective some of the same kinds of purposes from wherever they would be administered that we have here been discussing?

As I understood the purpose of the regional laboratories were supposed to have strong links to the State departments of education, links to the school systems, to universities, and that they were to have responsibilities not only for conducting what the Secretary has called basic research but also for development, whatever that word means, and for the dissemination of educational innovations.

The concepts we are here discussing today are not after all brandnew, they have been around for awhile.

Dr. OTTINA. Your statement is not accurate in today's environment. The regional laboratories have drifted away from that they have focussed more on development, on bringing forth products to answer problems. They have not become, let me use a very bad word, a wholesaler of products.

They have been out developing products and using the schools in that development, they have not been the regional network to infuse and disseminate as might have originally been conceived.

Mr. BRADEMAS. You used an interesting phrase, you said they have been "using schools in development," I think you said.

Mr. OTTINA. They have been using schools.

Mr. BRADEMAS. That goes back to the colloquy the Secretary and I just had with respect to the delineation of activities. The involvement of schools with the laboratories that have been carrying on the research is what you have called development. I have been trying to understand, I am simply trying to understand this spectrum or continuum of relationships of which you have been speaking.

In my judgment this is not a minor point; this goes to the heart of the effectiveness of this entire venture.

I want to see the NIE be effective. I do think that it may be important at some stage in this proceeding to have some definitions of what we mean when we talk about research, demonstration, development, dissemination. Otherwise may be we will just sit here and quarrel with each other.

Secretary RICHARDSON. May I respond a little further? What we are talking about now is fundamental not only to the NIE and to the Office of Education but to a great deal of what the Department of HEW does. We have been supporting what is somewhat loosely definable as research and development over a very broad front. Now the harder the science that is supported, without pausing to define a hard science, the better justified in terms of apparent results the research is and the better is the mechanism in place for the evaluation of its quality and for its dissemination.

I asked early on in my tenure in the department what we could show for all the R. & D. we have been supporting in the decade and/or more since I had left in areas of public welfare and education, rehabilitation and so on.

I asked the assistant secretary for a planning evaluation to canvass the department to see what we could shake out of the system in the way of identifiable results, particularly results that seemed promising, seemed to deserve wider applications, but had not been and somehow had failed to be translated into practice.

This has led to a number of conclusions.

This has led to the conclusion, for example, that it is very difficult to identify these things. We have developed a list. I am now trying to find out what we can or should do to improve our capability to disseminate and get these things put into practice, not just as a product of education but any of these things, treatment of alcoholism, drug abuse, and so on.

We find that some of the deficiencies are, first of all, that we have not had in place a vigorous enough process in management in research and development to be sure that what we were funding was a worthwhile project in the first place. We have not again had in place a rigorous system to assess the quality of results.

We ought to have, and I have taken steps to try to assure that we do have in the future, a standard operating procedure as to each project that falls in any sense under the heading of R. & D. which would lead us to ask has anything been learned at all or was this project a waste of time and money. If something was learned, what next step is indicated, is it a solid enough job so that the results should be made the subject of some effort to disseminate them, if so, how? Is it the kind of thing that is primarily of interest to other scholars in the field or could it have value for the administrators and people on the firing line within the delivery system, whatever it is? Is it a project such that it ought to be repeated under different circumstances and perhaps in the more sophisticated form? Is it a project that has produced fundamentally important results and which should be made subject to a real effort to get it to the attention of the people who could take advantage of it?

Now when you get to the last kind of thing you realize that the Department of HEW in general and the Office of Education in particular do not have people who can do the job of cross pollination, bringing to the attention of the people who are administering programs the results of this kind of really solid work.

Now the answer I gave you earlier assumes that the NIE will not itself have on its own staff a whole lot of people who are out there selling these results. I like to use them at different times for different ways of putting it. But we need in effect people who are like the detail men in the pharmaceutical house who go out and talk to the doctors, their effectiveness and value depends on the relationship and trust they develop with the doctor. The doctor believes in them when they tell him that something will do such and such. Whatever you think of the system it depends on their making this kind of call on them and upon the relationship they have.

We need that kind of person working out of our regional offices who are able to bring to the attention of the people who can use the results

of the solid significant research and development that has been tested and proven and found valuable and so on.

Now this does not mean that the NIE will not have a major role, particularly within the community and researchers in dissemination of research results. You ought to have at least the same kind of concern with this kind of dissemination that the National Cancer Institute does in the field of cancer research and so on. But there is a distinction between this gradation with a clear-cut function at one end of the scale, one end of the spectrum, between the kind of dissemination that takes place among researchers and people commonly interested in an area of inquiry and the kind of dissemination that takes place in effect and in effect going to the fellow who is administering the school system and saying did you know about this project, have you not thought about this potential application for you?

These are different types of people, the kind who are engaged in the sort of dissemination that a research-oriented institute would do and these people in the field working for the Office of Education and out of our regional offices.

Why don't I stop there? I think this really does go to the heart of the Federal role wherever what we develop knowledge and to support the activities of other people who have direct responsibility. You could divide all HEW functions between the direct operations, like the social security system or like the provision of health care to Indians or inspection and testing for new drugs on the one side, and on the other those in which we help to support, encourage, stimulate the work of other people in education, in social services, rehabilitation, in health care of most people outside of the Indians, public health service hospitals and so on, and wherever the direct responsibility falls to someone else we are concerned with this whole set of functions that they have been talking about.

It is important, we think, that we see a distinction appropriate for the role of NIE on the one side and the Office of Education on the other along the lines that I have been trying to describe.

Dr. MARLAND. I offer a small illustration. I will be very brief with it. Last summer the administration conceptualized an idea known as the emergency school assistance plan. It was in a sense acting as a conceptualizer and creator of a need. The administration and Congress said we must correct the racial separation of young people in the schools, especially those under court orders in the South.

Congress acted forthrightly and delivered to the Office of Education a task to be performed almost instantly. On August 17, I believe, the Office received the law that required action by the opening of school, to get something done to correct racial segregation that has so long plagued us.

The Office of Education had about 60 people they could put together, train briefly and quickly under emergency conditions and deploy program support to the regions, to the school systems, and the States in the 11 States in the South.

Those people were not the conceptualizers of the idea of racial desegregation. That had happened that was as though it had been an act out of the National Institute of Education. But they had the trust of the people in the school systems, they were able to sit down elbow to elbow with school superintendents and boards of education and work

out creative solutions, sometimes late into the night. Today as a result of that work last summer, done under very severe conditions of duress, we substantially have improved the situation in the 11 States of the South.

What made the difference was the presence of mobile persons, concerned persons, persons who were trusted moving to the field with a great idea. It came off.

Now it is in that mode that we speak of the delivery system. The role of the Office of Education working through its network, through a network of trusted human beings moving to and from the States with ideas, can be a critical one.

Mr. BRADEMAS. I think, Mr. Secretary and Mr. Marland, what you have both said with respect to the appropriate relationships between NIE and the Office of Education in respect to disseminating the results of research is very helpful.

I am grateful to you for it. I would confess, and I hope we can come back to this another time, that I am not yet as clear as I, for one, would like to be on the relationship between let us say research and demonstration, between research and experimentation.

Dr. MARLAND. I would try to answer that for you. I think that our testimony and certainly the law as we have proposed it attempts to make that clear, Mr. Chairman, and it is very important that we make that clear even today, I feel.

We see the National Institute of Education engaged, as responsibly committed to research in the broadest sense, from basic, abstract research down to what might be called action research and all that range inbetween.

Then comes experimentation and validation, taking the ideas once they have been formed and tested in the laboratory of the NIE, right into the field, into the real world of children and teachers and school administrators in Philadelphia, or in Newark, or in Poughkeepsie. Ideas would be tested to find out whether they hold together in the field that is experimentation.

At that point is where the dissemination starts. Now certainly NIE does not wash its hands of dissemination. But it will not be geared either in personnel or in this network of communications to take that idea and support it in operation in the classrooms across the lands. That is the role of the Office of Education as we have now perceived it. These are closely intertwined; as John Ottina says there is no sharp beginning or end. It calls for a relationship during this process of moving from the pure original idea to its operation in the schools of the land. These two are mutually dependent instruments, the invention of the idea of the NIE to start with and its implantation across the land in the other extreme.

The greater part of the process having to do with inquiry and experimentation, demonstration, validation, replication, is NIE's task.

Mr. BRADEMAS. I find that statement, Mr. Commissioner, very illuminating. But you will appreciate—maybe you won't appreciate why I say, after having heard that, which I think is very valuable to our understanding of what you have in mind why I say that you could on your chart, where you have placed the National Foundation to our understanding of what you have in mind, why I say that you for Higher Education you could well have a National Foundation for

Child Development and you could have a National Foundation for Career Education, or a Foundation for Elementary and Secondary Education at least logically.

I am not talking about the physical problem, that is another problem and a serious problem, but at least logically, given your analysis I think it would be appropriate to have all these foundations.

Dr. MARLAND. I understand your question, it is a very searching question and one I respect. My answer can be quite brief. You ask why not a national foundation for any components of education as we now are constructing it. Our reasoning is this. Historically throughout the United States, there has been a relatively coherent system for education at the elementary and secondary level. It is a sharply defined and politically, economically, and geographically established system. It is in place. Some parts are good, some parts not so good, but it is there. You have now, in NIE, an instrument for reaching that through developmental work. You have the resources of the Office of Education to reach it; it's there and in place and it is reasonably simple and understandable.

On the other hand, at the higher education level we have nothing remotely approaching the system now in place for elementary and secondary education. You have none of the political framework, you have none of the economic framework, you have none of the geographic framework, you have none of the historic arrangements that have established and held these institutions over time. We have a wide variety of higher education institutions, approaching quite different goals, operating under quite different philosophies, dealing with quite different patrons and quite different resources, ranging all the way from very exclusive and high-cost institutions, privately endowed, to the other extreme with which you are well familiar.

I would say higher education has no network. It has 23 different associations engaging the higher education community, all of whom at the moment either are competing with each other or collaborating hesitantly, if at all, and engaged in different pursuits in a different time frame and in widely different goals and objectives. Now I would say therefore that creation of a Foundation for Higher Education, exclusively aimed at higher education would for the first time provide a centrally established resource to bring the many parts of higher education together in common.

It would give higher education a centralness, a resource on which it can draw so it can reform itself and respond to the needs of this Nation over the next 10 or 20 years. To establish a counterpart for, say career education, et cetera, would be unnecessary because a system is now there and the heart of it lies in elementary and secondary schools already established and understood.

Mr. BRADEMAS. Let me make two comments on that. First of all I urge you to read the new Newman report which I have read with great benefit. One of the central thrusts of the Newman report is the growing homogenization of American higher education. So Newman makes precisely the opposite point from the one which you have just sought to make in responding to my question, for you said that one reason we need a Foundation for Higher Education is that, unlike elementary and secondary education, higher education is so diverse, so plural.

Dr. MARLAND. Which I encourage.

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Mr. BRADEMAS. I do as well, but the whole point of the Newman report is that we are moving in precisely the opposite direction, that is, away from diversity in higher education and toward uniformity.

Second, I realize that there are different associations and organizations speaking for higher education, but, as you know as well as I, there are a lot of different organizations and associations representing elementary and secondary education, too. So, I don't quite understand your citing historical origins or present diversity as a rationale for your proposed National Foundation for Higher Education.

William N. Cannon, vice president of the University of Chicago, and I discussed this question last week when Frank Newman told us about his report. Mr. Cannon gave me exactly the answer you gave. I said, Bill Cannon, are you seriously telling me that the only reason that we ought to stimulate change in higher education, as distinguished from seeking to stimulate change in elementary and secondary education, is that higher education is today characterized by diversity while elementary and secondary education is not?

Mr. Cannon also went on to argue in effect, even as you do today, that because something is already in place, in this case—in your view and his—elementary and secondary education, it ought not to be changed or, in any event, was not the appropriate target for change. That higher education is all of this argument was by way of trying to explain why we should have a Foundation for Higher Education but not for elementary-secondary education I find the reasoning very faulty.

Dr. MARLAND. Mr. Chairman, may I make a brief comment on this? I think the element of consistency between these points is in the heterogeniety of higher education, but at the same time a tendency the Newman report pointed out, to gravitate toward certain common denominators. There is a need for a single entity that can relate to the whole of higher education for the purpose of encouraging the reverse of that process and of supporting new modes and new institutions.

It is the creation of a place to which one can come, people who want to innovate and reform can come and if they have a well conceived project get help to put it into effect. So it is a pragmatic conclusion, essentially, that the history of higher education gives you a different existing pattern which requires a different source of support for the people in it who want change.

Mr. BRADEMAS. I won't trouble you longer on this question. I simply observe that the answer you have given me in justifying the foundation in one area—higher education—as against a foundation in the other, I think you will find in rereading the record, is to cite both the historical fact and the present situation that there is a great heterogeneity in higher education which does not exist in elementary and secondary education.

I simply think there is another point of view that, I may say respectfully, says that this description may not be altogether accurate just looking at the facts. You are one of the great school superintendents in the country, Dr. Marland, and what you did in Pittsburgh, for instance, in giving leadership to help make it possible for public and parochial schools to live side by side and in common cooperation is not what you find in every big school system in this country.

Dr. MARLAND. That is where technical assistance and leadership come in, Mr. Chairman.

Mr. BRADEMAS. That is not my point at all, as I am sure you appreciate. You have justified a case for a National Foundation for Higher Education but not one for elementary and secondary, for instance, not on the grounds that reform is more pressing and urgent in higher education that it is in elementary and secondary but, rather on a recitation of the proposition that the existing higher education system is more diverse than is our elementary and secondary education system.

Now this is a big country, and there are all kinds of elementary and secondary schools in it as well as all kinds of colleges and universities. So I would hope you could come up with a much stronger argument for your case than this one.

Dr. MARLAND. I may not have made the argument well but I think I failed to emphasize that you have 50 centers for reform, if you will, hopefully for research and development.

Mr. BRADEMAS. I would hope not.

Dr. MARLAND. This is the fact as it is, Mr. Chairman, the Constitution as you well know establishes the State as the responsible agency of political government for the control of the schools. Our effort for elementary and secondary education, which is a charge to the States, is through the States, as distinct from higher education. Each State has its own research and development headquarters, each State has its own network to its school systems. The universities have nothing of that kind, in fact they find ways (and quite properly) to continuously differ. In the elementary and secondary schools you have 50 centers for R. & D. in charge of reform and——

Mr. BRADEMAS. Smile when you say that, Dr. Marland.

You don't really expect me to take seriously the proposition that each of the 50 States in the United States of America in the year 1971 has its own center of research and development in education?

Dr. MARLAND. Modest though it may be, Mr. Chairman, and widely variable indeed. I would have to say that a few States have superb centers for R. & D. Some have extremely weak centers but nonetheless they are there and they are real and we have to deal with them. NIE would use this very vehicle, as the Secretary has stated, for delivering through these systems the product from a higher level of R. & D., if you will, into the classrooms. There is no such network, no such vehicle, no such delivery system for higher education, and we propose to create one.

Secretary RICHARDSON. Mr. Chairman, along this line you can look at it in the context of the ways through which the Federal Government supports education.

Take, for example, the proposal we are now in the process of drafting for education special revenue sharing that would take a lot of existing categorical grants programs and reduce them to five major headings. The assumption here is that we are dealing with this developed governmental system for the provision of elementary and secondary education that the Commissioner has referred to, so that you can, therefore, divide the money into big chunks and rely primarily on this system to use the money.

We are groping still with how best to design a Federal role for the institutional support of higher education. But in the meanwhile, lacking this structure through which Federal funds can for the most part

be disseminated, be distributed, we think that we ought to create a vehicle to distribute money on an institutional-by-institutional basis where the institution itself is interested in bringing about change.

So it seems to me you can't look at this distinction in terms of what has developed in fact in the way of distributing support that the Federal Government can use.

It exists to a far greater extent than elementary and secondary education because this has largely been a public responsibility for 150 years. Whereas, in the case of higher education, while it has become increasingly a public responsibility in the last decade or two, we still do not have this institutional matrix through which to distribute Federal support.

I think this is another way of maknig the same point. We will be returning to it, of course, in hearings on the foundation.

Mr. BRADEMAS. Yes; gentlemen, I thank all of you very much indeed. If I have been somewhat aggressive in my questions, I hope you will appreciate it is really a better understanding.

The Chair would like to announce that on Friday of this week we shall be at Princeton University visiting, in connection with this legislation, the Educational Testing Service, and that on Saturday, Sunday, and Monday, we shall be in New York City meeting Mayor Lindsay and Chancellor Scribner and Frank Keppel and Harold Howe II, Robert Dentler and other educational authorities. We hope to pursue with these gentlemen some of the questions we have been pursuing with you and we are very grateful indeed to you for having come today and for having been so generous with your time and your views.

Secretary RICHARDSON. Thank you very much, Mr. Chairman, we appreciate the opportunity.

(Whereupon, at 5 p.m., the Select Subcommittee on Education of the Committee on Education and Labor, adjourned subject to call of the Chair.)

TO ESTABLISH A NATIONAL INSTITUTE OF EDUCATION

SATURDAY, MARCH 20, 1971

HOUSE OF REPRESENTATIVES,
SELECT SUBCOMMITTEE ON EDUCATION,
OF THE COMMITTEE ON EDUCATION AND LABOR,
New York, N.Y.

The subcommittee met at 10 a.m., pursuant to call, at the Center for Urban Education, 105 Madison Avenue, New York City, N.Y., Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas, Scheuer, and Hansen.

Staff members present: Jack G. Duncan, subcommittee counsel; David Lloyd-Jones, staff; Martin LaVor, minority legislative associate; Christina Orth, assistant clerk.

Mr. BRADEMAS. The meeting will come to order.

We are very pleased to accept the gracious hospitality of our friends here in New York, and in particular, of Dr. Dentler and the Center for Urban Education.

We are meeting here in New York City today for the further consideration of the bills H.R. 33 and H.R. 3606, to establish a National Institute of Education.

The Chair might just make, for the benefit of those who may not be familiar with the purpose of this legislation, a short opening comment.

On the 3d of March 1970, President Nixon, in his message on educational reform, proposed the establishment of a National Institute of Education in the Department of Health, Education, and Welfare, which would serve as a focal point for research, demonstration, and innovation at every level of American education.

This proposal of the President represents, the Chair believes, one of the most promising enterprises in American education to come from an American President in some time.

The Chairman makes that observation as a Democrat—and adds that he joined a number of his colleagues on both sides of the aisle to introduce the bill to establish this Institute.

The administration, a year, or more, commissioned Dr. Roger Levien, of the Rand Corp., to make a study of the structure and purposes of the proposed NIE.

The study is about ready to appear in final form, and on Tuesday next in Washington, the subcommittee will be hearing from Dr. Levien.

In the meantime, our subcommittee has been hearing, both in Washington and elsewhere in the country, the views of leading authorities on education.

We are very pleased today to hear from three, not only nationally but internationally known, experts in American education.

The first of our witnesses is an old friend who has served with very great distinction as the principal Federal official with responsibility for education, as the U.S. Commissioner of Education, Dr. Harold Howe II who is now serving as vice president of the Ford Foundation, in charge of the Division of Educational Research.

Dr. Howe, we are very pleased indeed to welcome you here this morning, sir, and we look forward to hearing your views on the proposed National Institute of Education, and of putting some questions to you.

STATEMENT OF DR. HAROLD HOWE II, VICE PRESIDENT, FORD FOUNDATION, DIVISION OF EDUCATIONAL RESEARCH

Dr. Howe. Thank you very much, Mr. Chairman. It is extremely pleasant to be here. It is like old home week for me. I can recall many interesting discussions with you and your associates several years back.

I would like to say that I have written the chairman a rather long and somewhat analytical letter about the proposal before the committee, and I would like to ask that that be entered in the record of the committee. I won't read it.

(The letter referred to follows):

THE FORD FOUNDATION,
New York, N.Y., February 2, 1971.

Hon. JOHN BRADEMAS,
Chairman, Select Subcommittee on Education, U.S. House of Representatives, Washington, D.C.

DEAR JOHN: Thank you for your letter of January 7 inviting me to comment on the proposed National Institute of Education, which your Subcommittee is presently considering, and enclosing the draft *Preliminary Plan for the Proposed Institute* prepared by the Rand Corporation.

I strongly support the basic idea of a National Institute of Education to focus increased federal energy and resources—both human and financial—in an expanded program of educational research and development. Such an Institute is greatly needed because of four related but distinct problems that have long plagued federal research efforts in education.

The first of these existing difficulties is the fragmentation of education research within the federal bureaucracy. A variety of federal agencies within and outside of HEW currently support educational research activities. A new National Institute of Education could provide coordination among existing federal research programs concerned with education, and I hope it will be assigned such a role. The NIE proposal makes sense in its own right, but if it is to be truly effective it must help to get the Federal government's education research house in order. Only when here is an overall Federal research policy for education in which the research efforts of OEO, NSF, NFAH, the Labor Department, and other agencies play purposeful parts in an overall research strategy for the nation, will there be truly significant progress on the education research nad development front.

A second problem with federal research efforts is that they are frequently changed to meet short-term budget problems or short-term political decisions regarding priorities, thus reducing the likelihood that research activities will be allowed the continuity necessary for meaningful results. Tough problems facing educational research today are not amenable to quick and easy solutions. A good research program will require a persistence and continuity that has not been present in most federal education research efforts in recent years. I would expect the proposed National Institute of Education to be able to resist short-term cycles of political priority and to function as an effective problem solver over the long haul. Provision for a five-year term for its Director and continuity for its governing board will help to guarantee this capacity to keep working on important problems.

3. Helping with solutions to particular problems of schools and colleges or education as a profession (Objectives I and II).

In other words, the National Institute of Education should encourage fundamental research and help to develop a system which will support applications and experiments related to it. Only as a third priority and in limited ways should the NIE get directly involved in administering programs, schools, and experiments in this connection, I have some doubts about the advisability of NIE assuming all the tasks assigned to the Directorate of Programs in Chapter IV of the draft document. Its grants and evaluation efforts should reach to all kinds of organizations, but it should steer clear of direct operational responsibility for experiments on a large scale.

Given this background, the Institute should focus its attention on a few long-range, basic educational problems. The Institute must avoid the danger of diluting its energies across a multitude of overlapping, non-cumulative smaller efforts; it cannot be all things to all people. I suggest a formulation of priority problems such as the following which are offered as examples and not as a complete listing:

1. High priorities should be given to the heart of education itself—learning—particularly learning in the early years. Evidence is reasonably clear that early learning significantly shapes later learning and restricts later efforts to relearn. We are just beginning to scratch the surface of knowledge about how children learn, how they respond to various educational programs at different stages of development, and how schools and colleges can be managed to induce the most effective possible student performance.

2. Parallel to its focus on learning, the Institute should concentrate on the important by-products of the learning process. I include here consideration of attitudes, behavior, and viewpoints which accompany learning and which may be as important for the individual and for society as what is learned in the way of skills or knowledge.

3. Education is a labor-intensive activity which has not been responsive to the introduction of alternative technologies. The Institute should place major emphasis on the realistic development of educational technologies which hold promise of extending the reach of educational institutions beyond the classroom and of improving the cost-effectiveness of classroom instruction itself. Sesame Street, for example, reaching several million children daily at an annual cost of about eight million dollars, has begun to realize, perhaps for the first time, the enormous educational potential of television. The development of alternative technologies and the use of cost-effectiveness analyses of educational processes is needed both in higher education and in schools.

While I am not opposed to the Center for Education Studies mentioned on page 116, I think that it could create some problems which need to be foreseen. For example, I would have real concern about a national curriculum for social studies being developed in a center which is directly a part of the Federal establishment, although I would think it quite appropriate for NIE to make grants for the development of social studies curriculum to schools, universities, or other agencies. So the role and purpose of the center needs careful thought. Perhaps its most useful function would be as a center for developing research strategies in education. I would like to see more discussion of the relationship of NIE to the universities than occurs in the draft document. In general, I think that permanent staff of high quality in sufficient numbers is going to be difficult to attract and hold in a Washington-based center. The universities will remain the places which harbor the teaching and research that nurtures new scholars interested in education and related issues. At the least the center needs authority to establish liaison with universities in a variety of ways.

I think it would be a mistake for the Congress to legislate in great detail in regard to the NIE and prescribe program and organization in the kind of detail outlined in the Rand Corporation draft. If this draft is discussed by our committee and a legislative record established in regard to it, the next step should be the creation of the agency and the advisory committee with broad directives in the legislation but with options to develop details of program and organization.

With regard to the structure of the Institute, the National Advisory Council should include scientists, laymen, and perhaps a few foreign as well as American educators and researchers. It must not be allowed to become the captive of any particular branch of the educational establishment—certainly not of the educational research community or the educational administrators. The presence of

a few distinguished foreign scholars and educators on the Council would help to insure the autonomy and broad orientation needed for the Institute.

Organizationally, the Institute should be separate from the day-to-day operations and programs of the USOE, yet working in close parallel with it. It should certainly not be expected to perform the routine planning and evaluation functions now conducted by USOE bureaus. The fundamental point is whether the Director of NIE takes his budget to the Secretary of HEW and to the appropriations committees of the Congress separately or through the chief education official in HEW, whatever his title may be. Although there are good arguments on both sides of this question, I think that the Director of NIE should report through the chief education official of HEW.

There are other organizational issues to be solved. Over the past six years a large number of education research centers of various kinds have been started with Federal funds. There are Regional Education Laboratories, Research and Development Centers at universities, special research activities to serve vocational education, education of handicapped children, and teacher training, all currently maintained by research funds of the Office of Education. Many of these programs and centers are just beginning to be productive. Like any new research effort, they have been through all sorts of growing pains. While these activities clearly need periodic evaluation to determine their worthiness for continued support, my judgment would be that most of them should be kept going. There is considerable evidence that they have made really useful contributions to educational change or are on the threshold of doing so. It is important, therefore, that NIE supplement and coordinate this existing network of activities rather than attempting to supplant it. The funding of NIE will require money to continue these existing activities and to add new functions and programs as well.

The establishment of such a National Institute of Education would be an important step in organizing within the Executive Branch the research and management capabilities needed for an attack on the educational problems facing this nation.

I trust that these views have been helpful to you and the members of your Subcommittee. If I can be of any further help, I will be pleased to do so.

Sincerely,

HAROLD HOWE II, *Vice President.*

Dr. HOWE. This letter was based on the information that was in the Rand study, and I would certainly commend the committee on having looked as deeply as they have into the various alternatives and possibilities for mounting a new research-oriented organization in the context of the Government before solidifying the legislation.

It does seem to me that that Rand exercise was well worth going through. It made many useful and substantive suggestions, and you can see the influence of it in the legislation that is now being discussed.

In regard to that legislation, H.R. 33, I have had opportunity to read it, and I think my overall view is that the general structure of the bill is excellent.

It gives a broad and clear directive and a clear line of purpose; it gives an opportunity to a person who, as director, will certainly be a significant individual in the development of education in the United States; and it provides him with a national advisory group which I think will be able to attract absolutely first-class people because of the broad nature of this bill and the kind of responsibility which this bill clearly lays on the director and on the national advisory group.

So I am extremely supportive of the way the legislation is written.

I would comment on several points in it which seem to me to represent important points of strength, which I hope would remain in the legislation.

First of all, it allows the new organization to range from theoretical research on the one hand, through the development processes of whatever the research may have found, into actual tryout situations.

It seems to me that that breadth of activity ought to be embraced in the activities of this new organization.

A second point, which you find in the proposed legislation, which I hope will remain in it—and it seems to be absolutely essential—is a very small phrase, but a significant one, that: "Funds appropriated for the purposes of this new organization shall remain available until expended."

This is an important point, particularly when you're talking about research activities.

I noted in the letter that I sent to the committee earlier that if such a provision could be made in the legislation, it would ultimately result in better design of research, better follow-through on research, and more useful research in the long run.

One of the difficulties of administering major Federal programs is that some of them have an annual cycle of funding which requires that funds be used in a given fiscal year or the subsequent fiscal year; whereas, for certain kinds of activities that may be a perfectly good arrangement, for research activity it seems to be less valid.

So I am delighted that this provision is in the bill.

I would remind you that in the Cooperative Research Act there was a provision which allowed certain of the funds to have no termination date. I think it was the construction funds, if I recall correctly, and I always felt that this was a very advantageous position to be in and led to better planning and better action in the long run.

I also think that the provision you have included here, which allows the new organization to provide for its professional personnel without the Civil Service regulations completely controlling the selection and administration of those personnel is a strong provision and important to have.

It is pointed out in one of the discussion pieces I received that this is analogous to the provision that the National Science Foundation has, and I hope that that particular portion of the legislation will remain.

Now I would like to raise one or two points or queries that cross my mind as I review this legislation and, perhaps in the case of one or two of them, give you my own recommendations in regard to them.

One is the question of how does this new National Institute fit into the establishment of the Federal Government, and specifically into HEW?

It seems to me something that, if it is not clarified in the bill, ought at least to be discussed in the period of examination of the bill, the various options examined, and some record made in regard to that particular issue.

My own view would be that the Director of the Institute should report to the Secretary of HEW through the chief education official of HEW, whoever that may be. It may be a commissioner; it may be in various reorganization plans, another official.

There was a time, a short time ago, when there was a combined Assistant Secretary and Commissioner, I believe, in the person of Dr. Allen.

But whatever the organization is in HEW, there is certainly going to be a chief education official.

It would seem to me that the Director of the Institute for purposes of planning his budget and for appearing before committees of the

Congress, should work with and through the chief education official of HEW.

A second point I would raise, which was again raised in the letter which I sent you earlier: What about levels of funding?

This is a very hopeful exercise which can be much diminished in its hopefulness if proper funding is not provided for this organization.

I note that you have in the bill not suggested any particular level of funding, but used the old phrase "such funds as may be necessary."

That is a perfectly reasonable way to create an open door.

I think what I am addressing therefore is really the question of administration policy as budgets are prepared for this particular legislation.

If the result of creating this new organization is simply to transfer to the new organization existing commitments for research activities and existing levels of funding in the administration's budget, and to continue on that basis, not very much is going to be gained.

It is important to keep in the forefront of this conversation the point that major new levels of funding are necessary for education research development and experimentation in the United States.

That particular view was strongly expressed long ago by John Gardner and his associates in a major report which they did for President Kennedy. It has come up again and again.

We have never had, however, in this country the level of funding for education research which we need.

If you look at the percentages of Federal moneys that go into support of research for health or into support of research for defense or into support of research for agricultural related activities, and I could name a variety of other categories, you will find, I believe, that education is a poor cousin.

It seems to me that the emergence of this new organization creates the possibility of being a slightly richer cousin, and I hope that will happen.

Then I want to raise a question that I have to raise without having a firm view of my own, not having enough facts. It is about the relationship of this new organization, the National Institute of Education, to another proposed new organization called, I believe, the National Foundation for Higher Education.

As I understand it, this National Foundation for Higher Education is part of the administration's proposal for higher education legislation this year.

I am not opposing that organization; I am simply saying that I think that there needs to be a careful examination of the roles of these two organizations. If there are to be two new organizations, serious consideration should be given to the possibility that one might do the job if the roles, after being examined, appear to be similar.

Without knowing more myself about what is intended for the National Foundation for Higher Education, I simply raise this as an issue which needs serious examination.

It is clear to me that H.R. 33 proposes a very broad type of organization, an organization which will work, not just in elementary and secondary education, but to concern itself with the affairs of colleges and universities, with adult education, with the whole spectrum of educational activities in the United States.

Depending upon its level of funding, and the definition of its role, it seems possible to me that some of the activities proposed for the National Foundation for Higher Education might be duplicative. This question ought to be resolved.

And then a final observation, which really relates to what happens after this bill is enacted, and has nothing to do with changing the bill in any way, is to raise the question of how large an in-house activity will be mounted by the Department of HEW and the new Institute.

An in-house activity I think of as analogous, perhaps, to the National Institutes of Health, which are there in Washington, or close to it, are closely related to the Department of HEW and have a direct line to it and have many permanent personnel engaged in research activity.

It seems to me that in the case of education it would be well worth examining the possibility of having the major activities of the new Institute farmed out to universities primarily, and perhaps to other research centers.

I am sure that some in-house activity is going to be necessary, but I think it probably ought to be limited.

And I believe that the kinds of people, the absolutely first-class economists, sociologists, psychologists, to name several categories, who ought to be doing the initial theoretical work, that is the first job of a research institute, find their natural home in the universities.

If they are brought to some sort of an in-house organization in Washington, it is very likely, I think, to be successful only if they are brought on a sort of leave-of-absence basis.

If you try to mount an organization which has a permanent staff and which people remain in for their careers, I don't think you are going to get the quality of people that you are going to get out at the University of Chicago, or the University of Michigan, or wherever, to give their careers to this kind of activity. They will want to return to those places for the reason that their professions find their natural home in those places.

So when this bill is enacted, I hope that particular viewpoint will be given consideration.

Mr. Chairman, these are my few comments. I return to the point that I think you prepared a very fine bill, and particularly a bill which will elicit the best in leadership in the directorship of the new organization and in the Council, and that is what is going to make it work in the long run.

Mr. BRADEMAS. Thank you very much, Dr. Howe. Your observations are most helpful.

I might say with respect to the last point on which you touched concerning the proportion of in-house activities that would be carried out by the NIE, of all of its activities there doesn't seem to be, at least in the hearings so far, to be any significant disagreement with the proposition you advance: namely, that most of the work would be done on a farmed-out basis.

This is what the President said. I think in his March 3 address he used the phrase "a major portion" of the activities, and this is what the administration spokesmen have suggested; and although we have not really addressed ourselves to this issue in any detail on the subcom-

mittee, I have the feeling that this is probably not a very contentious point.

Dr. HOWE. But I brought it up because there is mention in the Rand report—what's the gentleman's name?

Mr. BRADEMAS. Levien.

Dr. HOWE. In Mr. Levien's report of a considerable center of some kind, and I just didn't want that to get too big.

Mr. SCHEUER. You would consider that a center more or less with the capability of designing the comprehensive integrated research project, the elements of which mostly would be farmed out.

But you would say the total program needs overall designing in some central headquarters?

Dr. HOWE. Yes; I think you need first-class quality people on the staff, too, but I expect you are going to get them better by rotation than by permanent assignment.

Good scholars dry up in Washington. [Laughter.]

Mr. BRADEMAS. That's one reason we have left Washington to come here. [Laughter.] We were at Princeton yesterday, I may say.

Mr. SCHEUER. We seem to have three scholars who have left the Washington scene, and none of them seems dried up at all.

Mr. BRADEMAS. Maybe that's why.

Dr. HOWE. If you are suggesting that I am a scholar, you are wrong

Mr. BRADEMAS. Let me turn to another subject that you mention, Dr. Howe and that is the money.

It is clearly the intention of the administration to take some of the research activities which are now going on in the Office of Education, and transport them over into the new proposed NIE, though it is not yet clear, at least from what they have told us and in the minds of the administration, just what is to be moved and what isn't.

You suggested in your letter to me that the program should be launched with new money in the amount of $400 to $500 million, if I recollect correctly.

And I think Dr. Levien suggested—what—$150 million in the first year in new money?

The administration is proposing $3 million in the first year for planning purposes, and not a great deal of additional money beyond what is presently being expended by OE on research.

Dr. Albert Alford of the Office of Education is here today.

Dr. Alford, do you happen to have off the top of your head the exact amount of new money being proposed?

Dr. ALFORD. For the first year?

Dr. HOWE. For the second—for the first full year; let's put it that way.

Dr. ALFORD. I think the term was in the range of $30 million.

Mr. BRADEMAS. This is one reason that some of us on the committee who are champions of this legislation have a degree of reserve about the administration's commitment to the enterprise, especially when you consider it alongside the proposed $100 million for the Foundation for Higher Education.

So I think your point is very well taken that if you really mean business, you had better put some serious money into it.

Dr. HOWE. Yes.

Mr. BRADEMAS. Could I ask you some more questions about the structure of the organization?

Now, as I understand it, the administration was originally proposing that the NIE should be established on the same level in HEW with OE.

That posture has to some extent been modified in that the administration is now proposing what I take it you are in a sense suggesting, that the Director of the NIE would report to the Commissioner of Education.

No, you didn't state "to" the Commissioner; you said, "through and with" the Commissioner.

I put this question to you—in fact, one of the distinguished successors of Dean Keppel wrote me last week that the NIE ought to be able to spit in the eye of OE.

But will that be possible; will there be possible autonomy and independence and integrity on the part of the operations under the NIE if its Director must report to the Commissioner?

In other words, will the NIE's Director be a captive and will educational research be thought by educators in the country as captive of the Office of Education?

I put my question rhetorically.

Dr. HOWE. You ask what the people are going to think. There may be some who would have that view; I would not.

I think that the main protection against the National Institute getting under the thumb of an unimaginative Commissioner is really in the quality of the man you have as the Director of it and the quality of the council that you have advising on its policies.

And it seems to me that the main relationship ought to be in the annual budget-planning process and in appearing before congressional committees.

I would see a relative independence of regular operation. Well, you have another element in here, which I think is significant in guaranteeing a degree of desirable independence.

You have made, in this bill, the Director of the Institute a Presidential appointment. You have made it a grade V appointment.

I don't know what has happened or will happen to the grade of the commissionership. It was a grade V, I believe.

And then there certainly has been talk about making it a grade IV or III in the Federal hierarchy.

Mr. BRADEMAS. The only point there is that we have learned to our dismay, some of us, that being a Presidential appointee is no guarantee of independence.

We had the Commissioner of Aging before our subcommittee last week—Mr. Martin—who may be a Presidential appointee, but his entire program is being dismantled limb by limb by the Office of Management and Budget. He may have the title, he may have the salary, and he may be a Presidential appointee, but he has less and less money to spend, and he is a rather lonely man.

Dr. HOWE. There is no way to avoid the processes of the Bureau of the Budget in the Federal Government. At least lots of imaginative people have looked for ways to do that, and so far have not discovered any (laughter).

So, I think we just have to take that as given.

I do think that there is some prestige in the Presidential appointment.

Mr. BRADEMAS. Surely.

Dr. HOWE. And this is likely to attract a stronger person to this kind of assignment.

I think that the nature of research activity which involves decision-making on a regular basis about what to do with funds, with many, many choices available, is different from a program activity in which Congress has usually spelled out in considerable detail the exact purposes and even the lines and flow of money and sometimes formula grants to the States.

The Director of this new organization is going to have many options in the use of the funds that are made available to him.

And it is the fact that he has those options that makes his job a significant position.

I think that the Council is necessary because he does have a lot of options, and these should not be placed just in one man without an advisory organization of this kind.

I don't recall whether the Research Advisory Council that we had in the Office of Education was a body created by the Congress or not. I rather think not.

Do you recall, Dr. Alford?

I don't recall its being spelled out in legislation.

But I cite this just to tell you we had the need for an advisory group in research in the Office of Education when I was there, and we saw that we had one.

I am not a great enthusiast for advisory groups, because in general a Commissioner has too many of them. I had 27 and was chairman of 13, and that makes life busy.

I think in general I would oppose the formation of new advisory groups in the Office of Education and would seek to consolidate those that there are. But in this case I think it's important to have one as kind of a Board of Trustees of this organization, and within that Board of Trustees, I think, lies some of the independence of this new Administrator, who will be the Director.

I think that this Director ought to be thought of as a person whose main talents and interests and concerns are in the research realm, and who is a significant person in that area.

There ought to be the possibility of appointing a person there whose main talents will not be appearing before congressional appropriation committees.

I think the Commissioner ought to be a person who is capable in that area. So here again I see a possibility for a very constructive relationship between a professional research-oriented person and a more administratively oriented, policy-oriented Commissoner or Assistant Secretary of Education.

Mr. BRADEMAS. Well, I have some other questions, but I want to yield to my colleagues first, and then I'll come back if they don't ask them—Mr. Hansen?

Mr. HANSEN. I also extend a warm welcome to you and appreciation for your assistance.

On the subject of the Advisory Council, I gather that you approve very generally the way that is projected in the bill.

Let me ask who are the kinds of people that you think ought to be on the Advisory Council if it is to fulfill the functions that you envision?

Dr. HOWE. I think that there should be some major figures from the world of social science, some of them, on this Advisory Council; that is, sociologists, psychologists, economists.

I don't think it should be dominated by professional types, but they should have significant representation.

Because these are the academic areas which certainly have first priority in developing significant research work in education.

I think there should be representation for the kind of person who has had broad experience in turning research into action.

And then there is expressed in my letter a thought that I would bring up again. I personally think it would be wise to include on such an advisory council someone from the education and research community outside the United States.

There are many developments in education, particularly in Western Europe, which we in the United States tend to ignore; many things are known about early childhood education, about child development, and about other fields. The chairman is probably familiar through his visits around the world with some of the design and development that has been done in television education in Israel and Japan, and people who are knowledgeable about these kinds of things rotated as part of the membership of this group would make sense to me.

I think that, as in any advisory group, which I think of as a board of trustees, I would not load it just with specialists. I would have several people who have a broad, informed citizen's interest in the problems of education.

Here, at least, are four or five categories of people that I would like to include.

Mr. HANSEN. Could you list maybe the two or three highest priority areas for research that ought to be done in education for which the leadership could be provided in this kind of a vehicle?

Dr. HOWE. In the letter that I sent the chairman, I in a way answered that question in two different fashions: by setting up, as noted on page 3 of that letter, a priority for strengthening foundations of basic knowledge about education; second, building a vigorous educational research and development system in the universities and in the research laboratories, and then helping with particular solutions in the third priority.

Now, in giving examples of the kind of activities that might be conducted, for instance, the kind of work that might be conducted under those headings, I mentioned the fact that research on learning itself, knowledge about how human beings learn, about the effects of different methods of developing learning, different styles of teaching, different types of materials, the effects of these things on individuals, not just on their learning but on the value systems and attitudes that emerge from the learning process, which are probably some of the most significant results of education that we know the least about.

I know you can spend much time in trying to teach somebody some facts and not have the results you intend at all in his attitudes and behavior.

We need to think more and do more research on the effects of learning on individuals' attitudes and behavior. So there is an area where I think work needs to be done.

Turning for the moment to higher education, a job that I think needs to be done right now, which is a research job for economists, and hasn't been done, to my knowledge, grows out of the fact that you have before the Congress and before the people of the United States half a dozen major suggestions for how higher education ought to be financed by the U.S. Government.

Representative Quie has a proposal; Senator Pell has a proposal; Clark Kerr has a proposal; maybe you have a proposal; there are a lot of them around.

But in terms of really in-depth analysis of the effects of those several proposals on the colleges and universities of the United States over the long haul, what they do to institutions, what they do to students, how they affect the possibilities of change in higher education institutions—I don't know of any good job that has been done.

I suggest that the grant from this organization might dig into that kind of a problem of economic and educational analysis, and get us something that we really need. In fact, we need it before this organization is going to be created. So here are some examples, anyway.

Mr. HANSEN. A final question: I gather from your comments on this structure that you proposed here, that you generally approve placing the Director of the Institute on the chart in a way that he reports to the Secretary through the chief education officer.

But I gather, in further response to the questions from the chairman, that you are saying that more important than where it is or how it is arranged on the chart is the kind of emphasis and leadership that is given to it by a given administration.

In other words, any administration can make out of it, given this structure, about what it wants to, depending on the effort and the resources that are channeled into this program.

Dr. HOWE. Yes; and let me bring up something that I didn't bring up in the conversation with the chairman, perhaps in a speculative way:

I believe that the National Science Foundation and the National Endowment for the Humanities and some other special types of organizations you find in the Government have a term appointment for their directors, I believe it is 5 or 6 years in those two cases.

I personally think it will be well worth looking at the possibility of a term appointment for the directorship of this organization.

I don't see any sense in having the kind of man who is going to run this outfit turn over with administrations, as the commissionership now tends to do, and necessarily so. I am not arguing that that shouldn't happen because the commissionership is related to areas of public policy that the President is going to want to involve himself with, and the Government has got itself deeply involved in education, and any President is going to want his own commissioner as the chief education official.

But I don't see why that should happen in this organization. And I would like to ask consideration at least of the possibility of a term appointment for this director.

Mr. HANSEN. This is from part II, a kind of independence that the chairman referred to?

Dr. HOWE. Yes, sir.

Mr. HANSEN. Thank you very much.

Mr. BRADEMAS. I just would observe that I sympathize with what Mr. Hansen has just said on your point to perhaps giving a longer term to the director, because the question, it seems to me, of the autonomy and the independence of the NIE from either apparent or substantive captivity on the part of the Office of Education, I should have thought, would be very important in terms of attitudes toward the NIE both in the educational community in the country and in Congress.

We are very glad to be here, the Chair would like to say, in the home territory of our distinguished and hard-working colleague, Mr. Scheuer.

Mr. SCHEUER. Commissioner, I was tremendously impressed by your testimony.

Mr. BRADEMAS. You have to speak up, even in New York.

Mr. SCHEUER. Especially in New York [laughter]. The noise level is awfully high in this town.

I thoroughly enjoyed your testimony. I was impressed by it all, but you struck a particularly responsive note when you indicated a special area of research, namely, the economic research into how we ought to fund education programs, particularly higher education.

I sponsored an amendment to the Higher Education Act the last time it came up. It would have created a presidential commission to come up with a program of funding universal postsecondary education, and it finally got watered down to the President himself proposing a program to the Congress, which he never did, although it was partially included in his last message.

But I have had doubts for a long time about the relevance of the whole Federal student loan program, particularly to ghetto kids. I think the idea of borrowing thousands of dollars is alien to a large percentage of the people who want access to higher education.

One excellent study that was done in the field of financing higher education was done by the Veterans' Administration a few years ago. They did a cost benefit analysis of the World War II GI bill of rights and the veterans who enjoyed postsecondary education under that bill.

We spent approximately $14 billion on those veterans. They have already returned $15 or $16 billion to the Federal Treasury in the higher taxes they have paid over what they would have paid if they hadn't had postsecondary education and the higher earnings it led to. They are expected to repay that investment twice more in the course of their earning lifetime.

At that time we gave them *x* months of higher education in return for *x* months that they spent in the service. It was a moral obligation that we based the program on, with very little justification based on the cost benefit to society and the institutions which they went to.

Now, a generation later, we can see that the World War II GI bill played a major role of staffing the management and the professional ranks of our whole society.

I would say many, if not most Members of Congress got their higher education out of the World War II GI bill.

And I have thought since that it made sense, not only on the moral basis upon which the legislation was structured, but on a hard-nosed cost benefit appraisal of what these folks have contributed to society. Why don't we wipe the moralism off the slate and say now that it apparently pays to give every young person who wants postsecondary education a passport to postsecondary education at the taxpayer's expense, and forget all the Mickey Mouse about loans.

I would be in favor of analyzing a free ticket to the kind of postsecondary education that uses hundreds and hundreds of different models. It may be at computer operator school or barber college, or plant security guard, or major in Greek and philosophy at Harvard.

But it seems to me that we ought to make sure that your CUE is followed up by a very hardnosed analysis on whether we shouldn't forget the whole Mickey Mouse of loans and say, it pays to give every young person a passport to develop their talents to the utmost; and it ought to be paid for by the Federal Government.

And if they need a monthly subsistence allowance, as we had 25 years ago—and at that time it was $75 a month—they not only should have the free education but the wherewithal to pay some basic expenses while they are doing it.

I just want to say what a responsive chord you struck in me in making that suggestion.

Dr. HOWE. Thank you.

Just as an observation, I personally think that loans are not going to solve all the problems of higher education. I think that loans have a place.

There are a lot of students who need money, and this is one way for them to get money.

But they don't solve the big issues. And I think we need to dig in awfully hard and fast as to how you do solve the big issues, because the higher education institutions of the United States right now are in deep trouble.

Mr. SCHEUER. There is an irresistible force here: an awful lot of kids from the ghettos and the slums who want into the postsecondary education. They will not be turned aside by our past screening devices, the Carnegie test points, the college board examinations. They want in.

New York City institutions of higher education are facing a terrific crisis with the pressures of open enrollment, the necessity of spending large amounts of money through talent search programs and preparing kids who went to very inadequate secondary institutions to take advantage of postsecondary education. This has presented the higher education establishment in New York, and at Rutgers, and in other States, with problems of accommodating this demand—this demand that will not be turned aside.

It has confronted the establishment with financial problems that I don't see how they are going to meet without some kind of general funding program, so that every kid who wants in can go to the institution which would like to take him, and present his passport.

Mr. BRADEMAS. I might just observe—I don't know if it's on all fours with the colloquy between Mr. Scheuer and Dr. Howe, but I think I saw that last week there was published by Theodore Schultz

of the University of Chicago a book on educational research as human investment, as distinguished from his broader theories of education as investment in human capital, and it might be useful for us to look at that in the light of your colloquy.

Dr. Howe, I just have one other question to put to you; that returns to the point that you touched on at the outset of your remarks on the relationship between the proposed NIE and the proposed National Foundation on Higher Education.

I will just give you my own bias on it, and I am sure you will disagree with me; and if you disagree with me, in any event, tell me your feelings about it.

My own perception is that educational research does not stand very well on Capitol Hill for several reasons, one of which is, we don't know what it is.

Another is that whatever it is, we don't think it makes much difference.

And another, which is related to the first two, is that we have the apprehension that the fruits of investment in educational research are not really translated into the system.

My fear is that if there is established, independent of the NIE, a foundation on higher education the mission of which, as presently represented by the administration, which marks a significant shift from the original foundation purpose of a year ago, when it was supposed to be a general-purpose organization—if the foundation is now represented as a source of funding for innovation, experimentation, and reform in higher education, my apprehension is that the foundation will only buttress the fears of those of us in Congress, and those who pay attention to these matters that once again a sharp distinction is being made between research on the one hand anad its application on the other.

That is a tactical problem but it has important substantive implications. I have had a hard time trying to get from the administration witnesses a clear picture of the relationships that they seek to establish among basic research, application of that research through demonstration or experimentation, and then dissemination of the results thereof.

Have I given you a clear picture of what troubles me?

And then, by way of symbolizing this concern, we see $100 million proposed by the administration for the foundation, the design of which has not been subjected to nearly the amount of study and inquiry on the part of the administration that has been directed to the NIE, by way of contrast, in a request, for planning, of $3 million for the first year of the NIE.

And the administration is not asking for much new money for the NIE, even in the first year after the planning. They are asking by 1977, according to Secretary Richardson the other day, a level of $370 to $430 million in fiscal year 1977, which would include perhaps as much as $140 million in existing educational research money.

So that 6 years from now, the administration is proposing, if you use these figures, $300 million in new money, but you, Dr. Howe, are suggesting that there ought to be new money for the NIE in the amount of up to half a billion dollars in fiscal year 1972.

So my point is that, if you put all those budget projections together, along with the substantive questions that I have tried to pose, it seems

to me that the administration hasn't thought this problem through very carefully, to put the most generous interpretation on it.

Dr. HOWE. Let me make just a couple of comments on that:

First of all, it seems to me that the continuum of research, design, and development of tryout and disseminations is really a continuum with an interrelatedness in all the parts of it in which there are not straight lines.

And that sometimes your researcher finds himself on the front of tryout in order to establish his results, and therefore I think it is very difficult to assign to an organization discreet pieces of that spectrum, and fence it out of other pieces of that spectrum. It is all interrelated, and needs to have the sort of hunting license that this bill gives this new organization.

In regard to the congressional view of educational research, I suspect you are right.

I think there is one very good example of an education research activity that all Members of Congress know about, which they probably don't think of as an education research activity. It is "Sesame Street."

When I was in the Office of Education, I worked hard to preserve $3 or $4 million of research funds to put into Sesame Street, and finally got it there.

Some other private resources came in and created enough money to start a research job. And a research job was done for a period of a year and a half or more before there was any real development of program, and then that program was started on a trial basis. Some mistakes were found in it; there was feedback; it was redesigned, and eventually a product emerged.

That was an interrelated process. It is easy to see now as representative of this spectrum I was talking about.

I think other efforts of that kind can start with bets on research money, not necessarily in the media or television realm but in other realms.

And I think perhaps that is a good way for Members of Congress to conceive of a successful research effort with real results in education.

I don't want to try to comment beyond expressing my concern that I expressed earlier about the National Foundation for Higher Education, because I really don't know enough about it.

But I have a concern which would naturally lead me to wonder about some of the kinds of points you have raised.

I just don't yet understand how these two organizations are going to have their functions defined and put together.

Mr. BRADEMAS. Let me ask just one other question, before we allow you to cease.

And I ask you this question because your responsibilities at the Ford Foundation and your previous responsibilities in the Office of Education went clear across the spectrum of education in the preschools through graduate schools.

Now, we have the Office of Education with the Bureau of Higher Education, which spends money on programs.

Next, it is proposed that we have a National Institute of Education, one of the missions of which will be to carry out research with respect to higher education.

Third, the administration proposes that we have a National Foundation for Higher Education, which presumably is going to carry out demonstration projects motivated by a concern for reform.

It is curious to me that an administration that is devoted to overcoming proliferation of bureaucracy should be moving in this direction, but that is just an aside.

What has been difficult for me to understand is, the reason higher education should be singled out for a foundation of this kind, when one might well make the point that there ought to be reform in elementary and secondary education, or that there ought to be reform in vocational-technical, or career, education; or that there ought to be demonstration projects of a kind that are proposed for the Foundation for Higher Education for child development or preschool programs.

So that I don't understand the intellectual, the rational, the logical, rationale for a Foundation for Higher Education in particular.

There may be tactical reasons for the foundation. Indeed, I suspect there are. That, of course, is not my point.

Have I made my question absolutely clear?

Dr. Howe. This is the question I am raising without providing the answer: It seems to me at least the possibility that this all ought to be one organization. And that possibility ought to be seriously examined.

It may be that the tactical issues make it either politic or necessary to have two organizations, but there ought to be a serious look at these other possibilities.

Mr. Brademas. Thank you, Dr. Howe, very much. You have been very helpful to us.

Can we go off the record for just a minute?

(Discussion off the record.)

Mr. Brademas. We are now very pleased indeed to welcome back an old friend, who has given very great leadership to American education throughout his career, and most particularly as U.S. Commissioner of Education under Presidents Kennedy and Johnson, and is now the president of General Learning—Frank Keppel. Mr. Keppel, we are glad to see you, sir.

STATEMENT OF FRANCIS KEPPEL, PRESIDENT, GENERAL LEARNING

Mr. Keppel. Thank you very much, Mr. Chairman. I am afraid that what I'll say is likely to be repetitious. I know that that is not a new experience for Members of Congress, but this is particularly true because I follow Mr. Howe, with whose views I have very substantial agreement.

Which reminds me of my father's comment: "Nothing succeeds like a successor," [laughter] and in this case it certainly worked.

I will run through very rapidly, Mr. Chairman, what I have here, condensing my formal statement.

I will start by supporting the basic idea of H.R. 33. This represents a personal change of view over 3 or 4 years.

It seems to me the time has now come to do this.

I would also like, if the members of the committee would permit me, to make a point very strongly, which is my personal delight—I think that's the word I want to use—my personal delight and to my com-

mendation to the chairman and to the members of the subcommittee that this piece of legislation is introduced on a bipartisan basis; exactly the way this sort of legislation, it seems to me, should be introduced.

Anyone who has sat as Commissioner of Education is well aware of the fact that it is one aspect of Government which should, as far as is practicable, be a bipartisan enterprise.

(The statement follows:)

PREPARED STATEMENT OF FRANCIS KEPPEL, PRESIDENT, GENERAL LEARNING

Mr. Chairman, let me start by supporting the basic idea of H.R. 33. The time has come to establish a central point of initiative for educational research in the Federal Government. It is no longer a question of whether it would be wise to establish such an Institute; it is now only a question of how best to do so.

Let me comment on H.R. 33 section by section.

Section 2. It seems to me that arguments for educational research go beyond only the provision of equality of educational opportunity. The extent and the nature of investment in education is closely related to economic growth, for example. Nor can it be separated from the subtler issues of the quality of American life in myriad ways: appreciation of the arts, strengthening a capacity in basic research, etc. I therefore suggest that consideration be given to expanding Section 2 by adding words such as "to raise the level of quality of learning and teaching."

Section 3. I am not clear as to the relation between the National Institute and the present U.S. Office of Education. An argument can certainly be made to separate such an Institute from the day-to-day operations and the grant programs of the U.S. Office. On the other hand, I should think it unwise to separate it too far. In the long run, it seems likely that the United States will have to create a separate cabinet Department for Education. To plan for this eventuality, it might be sensible to establish the new Institute as a separate unit reporting to the Commissioner of Education. This would make a transition to a separate Department, of which the Institute would be a part, easier to accomplish.

Section 4. While I agree with the broad definition of the areas in which the Institute may work, there is surely danger in conceiving of it as the instrument of the federal government in "evaluations" and in "investigations." Whatever unit conducts such evaluations and investigations of current programs is going to be up to its ears in controversial and politically urgent matters. There would be serious danger that the urgent would take the place of the important and long term research effort of the Institute. And it is at least conceivable that the funding of the basic program of the Institute might be affected by current attitudes toward the results of surveys and evaluations. It would not be the first time that the messenger is punished for the message that he brings.

Section 4 does not make it clear, at least to me, how the Institute relates to a number of programs in the Office of Education that might be described as "development," if not "research." As a guess, the success of the Institute idea will depend in considerable part on keeping its focus on major issues rather than engaging in bureaucratic aggrandisement. May I therefore suggest that special attention be given during the hearings to a detailed review of research and development programs throughout the government and their possible relation to such an Institute.

Nor does the summary indicate the policy on allocation of funds to support investigations on the basis of the request of the investigator rather than on the basis of the current interests of the Institute. Perhaps these are matters best left to the Institute once established. But one matter is of such importance that it should be expressed in the legislation itself: that a substantial part of the work of the Institute should be in basic rather than applied research. We may be on the threshhold of major advances in understanding how man learns from the researches of biophysicists and neurologists as well as the research of psychologists. The Institute should not only be free to support such areas of science and scholarship but should be explicitly instructed to do so. Indeed, I recommend that at least one member of the National Advisory Council be selected from the staff of the National Institute of Health.

Section 5. More explicit language might be included in the Bill to encourage a free exchange of scholars and scientists between universities or other research

groups and the Institute. While the Institute would presumably want to have a permanent core staff, I can see sensible arguments for planning rotation of individuals on short term, sabbatical arrangements, etc. This is not just a bureaucratic question. It goes to a fundamental issue: the fact that the United States is in short supply as far as talented investigators in the educational area. It would seem a serious mistake to weaken the capacity of universities and other research groups by drawing away their talent into a National Institute which does not have responsibility for the recruitment and training of future investigators. Collaboration and interchange is essential.

Mr. BRADEMAS. May I interrupt to say that this subcommittee is singularly blessed with talented and creative and openminded members of the other party, and they have contributed enormously to the effectiveness of our work

Mr. KEPPEL. May I bring the attention of the subcommittee particularly to section 2 to the general purposes of the bill?

The argument as one reads it is an argument based primarily on research needed for the provision of equality of educational opportunity. Heaven knows I am in favor of that.

But it seems to me that to argue the case for educational research on the basis of the need for provision of equality of educational opportunity alone is to place such an enterprise on too narrow a base.

We have heard discussions this morning, for example, on the relation of higher education to economic growth, and also Mr. Scheuer's comment about the GI bill.

But there are a myriad of other areas, from the role of the arts in the United States, from strengthening human capacity for basic research in areas that in a sense have nothing to do with education.

I would therefore suggest, Mr. Chairman, that consideration be given to rewriting section 2, to make it clear that the purpose is broader than solely the question of providing equality of educational opportunity.

And I venture to suggest in my testimony general language which would relate to something like "to raise the level of quality of learning and teaching" in the United States.

With regard to section 3, I share Mr. Howe's uncertainty about the relationship of the National Institute to the present U.S. Office of Education.

Obviously, an argument can be made, and it should be made, that such an institute be separated from the day-to-day operations and the grant programs of the U.S. Office.

But on the other hand, I obviously am concerned that we separate it too far. The Government is not without "unrelated" planets in these matters, and one of the problems that Mr. Howe brought out I thought was very much to the point.

A Commissioner of Education, I presume, presiding over such an enterprise, could, if I may use uncongressional language, "louse it up."

He could do something else that augurs worse, which is to neglect the Institute. But even worse would be the possibility of such an Institute neglected by everybody. It could in effect become quite useless and would become one of those appendages.

I would on balance think it is better to have it hitched to a responsible, senior officer of the Government.

It is my personal view that in due course something like a Department of Education will be formed in one way or another; that is, a very senior representative of Government. I believe that the Institute

should ultimately report to someone who might be described as a Secretary.

Therefore, I agree with Mr. Howe on that point.

With regard to section 4, and the language in section 4, which includes practically everything that anybody could think of under the heading of "Research," I would like, if I may, Mr. Chairman, to make a few comments and point specifically to the words "evaluations" and "investigations," which I believe are included in the language of H.R. 33.

It is my impression that whatever unit of government conducts—either by contract or by handling itself—whatever unit conducts evaluations of existing programs is going to be up to its ears in controversial and politically urgent matters.

Here is an outfit which it is established which has the reputation of independence, of scholarliness in the advancement of knowledge.

If it also conducts evaluations of current programs, I fear that these may take the place of the research focus—and this is the feeling in my testimony generally, Mr. Chairman. They may take the place of more basic and long-term research efforts. The urgent will crowd out the important areas.

And it is at least conceivable that the funding—and I do not here refer to the Congress necessarily, nearly as much as I refer to the administration in power—that the funding of the basic program might be affected by current attitudes toward the results of surveys and evaluations conducted by this Institute.

It wouldn't be, certainly, the first time in the history of mankind that the messenger is punished for the message that he happens to bring.

Again I would like to refer to former Commissioner Howe's testimony. It is part of his point that section 4 does not make clear, at least to me, how the Institute relates to the programs that are now going on in the Office of Education, particularly those that I suppose could come under that vague word "development," as against "basic research."

Mr. Howe, in a candid moment some 2 years ago, pointed out that whoever it was who cooked up the existing educational legislation—and I think several of us around this table were at least connected with it—obviously cooked it up for the purposes of getting it going through the Congress, and not with an eye toward its administration.

He was quite right. That, I think, is a fair comment to make about what went on between 1963 and 1966.

And I take his lesson seriously. In this area I would think it would be very much to the point for the Congress to ask the management questions so that the subcommittee may have a record—including comments on these relationships.

I think a case can be made, Mr. Chairman, that the legislation itself, as well drafted here, should not be too precise about these matters.

I can see strong arguments for not putting detailed provisions in the language of the statute. Yet I can see equally strong argument—if of legislative oversight ahead of time, by placing some of its views on the administrative relationships on the record.

This could be done by poking questions at the administration—whichever is in power. I don't think it is important—to force it to make decisions.

Heaven knows, it would not be the first time that general ideas have been put up to the Congress that sound rather nice—in fact, I did it myself—without thinking through the administrative implications. As Mr. Howe pointed out correctly, this applies to much of the legislation that was passed in the mid-1960's.

It is not unreasonable for an administration to duck these nasty questions; why shouldn't they? But on the other hand, I cannot help but think it would have been very desirable for us, 5 years ago, to have been forced to push through detailed reasoning on such issue, if only for the sake of the Congressional Record, Mr. Chairman, and for the committee and subcommittee report.

There are a number of subheads to this. Let me just give a few: The bill does not indicate any policy with regard to the allocation of funds as between those spent by central initiative of the National Institute in programs which the National Institute has chosen, and those spent on the basis of the applications of individual investigators.

I think the history of science would show that centralized grant-making operations do not have a monopoly on wisdom, and that the really important ideas are likely to come from left field somewhere.

And I would hope that the record of the committee would show that it believes that such an Institute is prepared to invest a reasonable amount in "serendipity."

Mr. BRADEMAS. Right.

Mr. KEPPEL. I would stay away from the Defense Department, Mr. Chairman, if I may.

Mr. BRADEMAS. I'll interrupt you at that point because that was precisely one of the questions I was going to ask you. We were talking about the purposes, the functions under section 4, and I note that the language of the bill authorizes the promotion of the coordination of educational research and research support within the Federal Government.

You mentioned the Defense Department, which you said you wanted to stay away from the NIE.

Mr. KEPPEL. I didn't say—I wanted to at that moment. [Laughter.]

Mr. BRADEMAS. At some point perhaps you can comment on the question of what substantively could be described as educational research that is supported within the Defense Department or by NSF or by NIH, or other areas of the Federal Government, and their relationship to this NIE.

Mr. KEPPEL. Thank you, sir. I'll try, if I may.

The question is whether the Institute should put sharp attention on the basic investigators who are dealing with topics that don't happen to be currently fashionable.

I hope that the subcommittee report—again I am not suggesting changes of language—will include a statement of congressional intent that a substantial portion of the funds be allocated on the basic side of the continuum that Mr. Howe mentioned.

All the forces of our society are going to push funds from a variety of sources to demonstration and application.

I fear, and I think the history of the United States in the last 20 years in supporting the pure sciences, would show, that there's always the danger of slowly eroding the percentage of the funds and the energy that goes into the basic side.

By basic, I hasten to make it clear I do not mean just educational psychology.

Here I think we come to the partial answer, Mr. Chairman, to your question.

It would be my guess that over the next 15 or 20 years—and I presume the Institute is to be thought out in those terms—that some of the major additions to the understanding of human learning, are likely to come not from the psychologists and sociologists, but from the biophysicists, the neurologists, and from areas of applied physical and biological science.

And I would trust that it is the intent of the subcommittee and of the Congress that this Institue be authorized to invest in those areas.

Now, to be specific about this, it would seem to be very desirable as a part of the coordination of the Federal effort—which of course will never be fully successful in directing research—that there might be put on this advisory council, the National Advisory Council, representatives of the National Institutes of Health, and particularly on the side that I venture to suggest is a major area—from biology, biophysics, and neurology.

Something of the same interweaving interconnections would seem to me should also be done with the National Science Foundation.

I would think that this might be accomplished by statute somewhere in H.R. 33.

As to whether it should include representatives of basic research from the Defense Department side, I am a little more negative, Mr. Chairman. That would seem to me very much an offshoot of the work of any Defense Department at any time, and I should think the Council really wants representatives from the Federal Government, such as the NIH or the NSF, whose focus is in this area.

With regard to section 5—and then I'll be finished, Mr. Chairman—there is language in section 5 I couldn't quite understand.

Nothing could be sillier than for this bill to end up with a program in which basic scholars are taken away from universities, put into a center where they do not have students, where they do not have graduates, they do not direct growing future scholars and scientists.

In effect, nothing could be sillier than to embark on a program in which we cut off the head of the goose that lays the golden egg.

Now, the question of how to do it. Mr. Howe suggested a relatively small central staff, and I think, Mr. Chairman, everyone agrees with that.

He also suggested that—if I understood him—that there be a program of rotation back and forth between universities and the Institute.

I heartily agree. But we all know from practice that that kind of thing can be stopped by minor issues; hence my comments on section 5.

For example, is it possible under this legislation for a scholar to take a 2-year leave of absence from his university and continue his retirement under the usual university arrangements?

Is it possible for him to handle a number of the other mechanical issues which often stop this kind of interchange?

My plea is obviously that under this legislation, it be practical for a rotation of personnel back and forth to universities.

Thank you, sir.

Mr. BRADEMAS. Thank you very much, Mr. Keppel.

That is really most helpful indeed.

Let me just ask you a couple of questions, because I believe I appreciate your position on most of the key questions that I would like to put to you.

Do you have any feeling about the priorities; where ought attention be directed?

You mentioned basic research, in the learning process, I believe as No. 1.

Do you have any comment beyond that?

Mr. KEPPEL. It seems to me that in the present half decade we have seen the development of first-class research going on in early learning: in other words, something you can build on, in the learning of very young children.

It would seem to me that much of what we have learned in the last half-dozen unhappy years with regard to the education of the disadvantaged suggests that we would be a lot better off if we were building on a more solid foundation from the age of 6 than we now are.

So I would tend to put that quite high on the list.

But I heartily agree with Mr. Scheuer's point, and I guess also with Mr. Howe's, with regard to the application of economic analysis from the point of view of Government policy.

It is going to be all the more important, I venture to say, Mr. Scheuer, because I think a case can be made that as we start the process of providing some brand of postsecondary education for more than 50 percent of the age group, all the economic analyses that took place in the 1940's and 1950's about return on investment are likely to go up in smoke.

There is a real possibility that the interrelation between higher education and life-total earning may change dramatically.

Mr. SCHEUER. Excuse me, would you elaborate——

Mr. KEPPEL. What I meant was this: The basic result of the GI bill (the evidence as I understood it from what you said and I think I may have read part of the same thing) is that individuals who enter into and go through various levels of higher education end up with a higher lifetime earnings than those who do not.

We are now getting more than half our population into the same higher education category.

And I'm not so clear that we can predict the same relative return on investment, when you pass over the 50-percent point than you could when you were going from 20 to 40–20 to 30 percent, really, I guess—during the period from 1945 to 1960, which is where the evidence comes from.

Mr. SCHEUER. Yes.

Mr. KEPPEL. Now, I am no economist, Heaven knows, but it seems to me an extremely important question to ask from the point of view of the Congress, on allocation of resources.

Because, obviously, whatever resources are put into the support of higher education is going to come out of something else.

I am not persuaded that we should move to extrapolate that argument for the next 20 years on the same set of economic assumptions.

Hence, it seems to me, the importance of research into economics is a high priority.

Mr. BRADEMAS. There are, after all, noneconomic reasons for higher education.

Mr. KEPPEL. I would obviously tend to argue that case, but I fear that if we build a national policy on return on investment in purely economic terms for higher education, we may find ourselves eating our words in about 10 or 15 years, and I don't think the Nation can afford that.

Mr. BRADEMAS. That is a pretty important point in view of another development that is represented by the new Yale pay-as-you-go plan, because it seems at that institution—I guess there are those who love her——

Mr. KEPPEL. They just left. [Laughter.]

Mr. BRADEMAS. It seems that their proposal for student financial assistance is based on the proposition that those who get higher education will earn more money later in life and thereby ought to be paying for it then out of that increased income.

Mr. KEPPEL. That is a perfectly reasonable position, Mr. Chairman, for Yale to take in view of its admissions policies. [Laughter.]

Mr. BRADEMAS. I just have one other question: I was very pleased to hear you say that you felt that in this area of legislation, that this committee ought to be asking what you called the management questions, because more than any other piece of legislation that I can recall our having considered in this committee, I think we find ourselves preoccupied by questions of structure and location and tenure of director and autonomy, and independence, problems like these seem to be more significant in this particular area than in other areas.

And I know the administration probably isn't too happy that we are so preoccupied with these matters, but I just think they are crucial; otherwise, we are simply going through the motion and saying we are going to do something about educational research, but it will only run into all the old problems.

Would you maybe comment on that observation?

Mr. KEPPEL. Mr. Chairman, may I comment to this extent: While I agree that the questions may take the form of management questions, I think that the nature of the questions goes much deeper than what one usually calls management, and where the lines are drawn on the chart.

I believe the Congress is engaging in these questions, and exactly what I conceive of as the basic task of the Congress. They are fundamentally policy questions.

Mr. BRADEMAS. You have heard my sermon of apprehensions about the Foundation for Higher Education in this respect. We have not discussed this.

You tell me if you think that these criticisms are on target, off target, or ought to be modified—any comment on that problem?

Mr. KEPPEL. With Mr. Howe I have not had an opportunity to read the language of the Foundation for Higher Education, and must plead ignorance to it, though I would be glad to come back if you could give me some time.

I do have two general views: The first one that education, to use the visual image is a seamless web, I find it very difficult to separate at some arbitrary age level or at some level of academic work in 12th grade to 13th grade or somewhere.

So, as a general matter I tend to resist the conception of cutting it, unless, as Mr. Howe correctly pointed out, there is some tactical reason that he and I don't know anything about.

With regard to what I understand was the background thinking on the Foundation for Higher Education, I found Mr. Moynihan's speeches, which lay an admirable basis for saying that higher education ought to be reformed.

I don't think there is much debate about that question.

The question, it seems to me, is how. And I was not able to move from the essay to the National Foundation for Higher Education with any ease.

Mr. BRADEMAS. Let me explain to you why that might be the case: Mr. Moynihan, in testifying before this subcommittee on the opening day on the NIE, in response to a question about the National Foundation for Higher Education, in no way thought of the Foundation as the source of authority for reforming higher education, which is presently represented by the administration as the principal mission of the Foundation.

As a matter of fact, Mr. Moynihan told us that he thought of the Foundation as a general-purpose foundation, along the lines of the British University Grants Committee, which would substitute in the United States for a number of existing so-called categorical programs in higher education.

And he was rather astonished to learn, I can say on direct authority, that the administration had so radically changed its concept of the Foundation. As he was one who had a great deal to do with developing both the NIE and Foundation propositions, I think his views are entitled to some respect and consideration.

So, that judging from what Mr. Moynihan said, I think he has just not been brought up to date on the administration's change of thinking.

This brings us to the tactical questions to which reference was earlier made.

Let me put my point another way. It was my own feeling that the administration originally came up with the Foundation idea as a general-purpose proposal; then realized that this wasn't quite what they had in mind, so they have changed its purpose considerably, and now they are trying to figure out how they can justify the proposal.

Mr. KEPPEL. May I comment on this without regard to the present administration's proposals, which I don't know.

I think I would have to find myself in disagreement with the notion of a national foundation comparable in continent of the United States to the British University Grants Committee, which is a very different pattern. There you are dealing with 40 institutions; you have a capacity, it seems to me, to handle that.

For us to try to put together a national foundation in higher education, an enterprise that, after all, as Mr. Scheuer and Mr. Howe have tried to make clear, is an immense enterprise, a huge economic recourse, does not seem to me practicable.

I would be very dubious about trying to set up a national foundation for higher education dealing with over 3,000 institutions of higher education.

Mr. BRADEMAS. I don't think——

Mr. KEPPEL. I can only describe it perhaps as an Irishmen's view of England (laughter).

Mr. BRADEMAS. I don't think, to be fair to the administration, that that is what they have in mind at this point in time.

Sir, I just want to say how pleased we are to see the wife of one of our distinguished new colleagues from New York here, Mrs. Herman Badillo, with us today. We are very glad to see you here, Mrs. Badillo.

Mr. Hansen?

Mr. HANSEN. Thank you, Mr. Chairman. I would like just to underscore the points that you have made about the importance of this committee in its study of this legislation in building a record and issuing an oversight really at the outset.

I say that because this basically confirms the decision made early in Congress by our chairman and by the members of the committee to make these hearings and our studies something much more in depth than really we had undertaken, except in very few cases in the past.

The legislation is, and of necessity has to be, fairly brief, and I think fairly general; therefore it is I would agree, very important that we get on the record from those who are experts, such as yourself, the kind of conception you have of how it ought to operate, how it ought to be developed.

With that background I want to pursue to get on the record your conception on section 6 which you did not refer to in your prepared remarks, but you did make some mention of it in the Advisory Council, to learn what you conceive as the role of the Advisory Council, and also to learn your recommendations with respect to any changes that ought to be made—if you think they should—in the language of section 6, which will suggest the kind of a makeup.

And you see in the section there is nothing to say who or even what kind of people ought to be on this council.

Do you think we ought to do that in the bill; and whether you do or not, would you give us the benefit of your own comments on the way you think it ought to be organized and operated?

Mr. KEPPEL. Thank you.

First, to make the obvious point, if I may, I certainly do concur with the establishment of such a council.

I well realize that the Government is coated with advisory groups, and I rather sympathize with Mr. Howe's view that there are probably too many of them in relation to education.

I could also sympathize with his view that this area is one of the relatively few, it would seem to me, on which such an advisory group ought to be appointed.

But your question, of course, was much sharper than this general view on it.

I would myself tend to put the following criteria that might be worth putting in the bill. Certainly it might be worth putting it in the committee report.

I should have thought that certainly more than a majority of the members should be investigators of the sort that Mr. Howe mentioned, from outside the Government. At the very least, a majority should be individuals who come from outside.

Second, I would recommend, either in the bill or in the committee record, that certain explicit links be formed through the Advisory Council, one of them with the National Institutes of Health, one of them with the National Science Foundation.

Also conceivably (though I don't know if this is possible) with the science advisor to the President—I am not sure whether that elevated

group deals with lower levels of the bureaucracy, but if it does, it might be worth considering.

This is because it would give the possibility of the annual report, stated in section 6–A, as a requirement, and a desirable one, the chance to propose or describe Federal policy in this area.

And if it is required that representatives of the two, and perhaps three agencies of Government that I have mentioned are on this and sign it, you would have some chance, I think, of doing the coordination which I know to be the committee's intent.

With regard to the types of individuals, which I believe, Mr. Hansen, was part of your question, it might be recommended here, I would go along with Mr. Howe. I think that certainly these ought to be public members in the nongovernmental majority.

I would hope that there would be individuals in the basic, social sciences; economics, sociology, and the like, as well as the educators—may I call them professional educational research people.

In this sense I would then suggest a final criterion which is that those who are primarily engaged in their own educational research, who are in the sense feeding from this Institute, should clearly be in the minority on such a council.

Mr. HANSEN. One final question: What is your view on the suggestion that there be stated terms——

Mr. KEPPEL. Let me be candid, Mr. Hansen, I hadn't thought about that until I heard your colloquy with Mr. Howe.

And I am struggling with it for this reason—perhaps, if you will forgive me, I'd like to think a little bit more about it.

It would seem to me desirable that there be a pretty close link between whoever the man is in charge of the Bureau, or whatever it is called, in the Office of Education, dealing with higher education and this Institute.

There seems to me a strong reason for saying that whoever is in charge of the Bureau for Higher Education, should be at a level of Government in which the President of the United States and his senior Cabinet officers can get rid of him. This seems to me to be a case where the Executive should have some freedom.

Mr. Howe made a very good point here that in this job you could make a case for a term appointment.

My difficulty, Mr. Hansen, and I would just like to think about it, if I may, is that I see these two pretty closely related, and I see strong arguments in the one case for getting rid of them, and on this side for not doing so.

I'm sorry, sir. May I relinquish the chair on that. I just hadn't thought about it, a very shrewd point.

Mr. HANSEN. I would say in conclusion that your statements here and your remarks are enormously helpful, and I am most grateful to you.

Mr. KEPPEL. Thank you, sir.

Mr. BRADEMAS. Mr. Scheuer?

Mr. SCHEUER. Commissioner, thank you for your predictably stimulating and provocative statement.

You struck a responsive chord in me when you mentioned the necessary input of the biological sciences in such a Commission, and I

couldn't help thinking of the kind of a contribution that a chap like René Dubos could make.

I feel that if we had applied some of his research that he completed years ago on the implications for the development of mice and rats, of an inadequate diet—not a starvation diet, but an inadequate diet—and an inadequately stimulative environment, and his findings that much irremediable damage is done to the development of the cortex of the brain by a point in time equal to perhaps two in the human child.

If you think of the implications, the horrifying appalling implications, of that to the failure of our educational systems to provide children in their first and second years both with an adequate diet and with an adequately stimulating and challenging environment, you would feel that if we don't meet that need long before the child even gets to preschool, that we have lost the battle.

Mr. KEPPEL. Mr. Chairman, if Mr. Scheuer permits me to make a confession—I am not at all sure that congressional committees are designed to hear confessions from ex-bureaucrats—but I would like to get one on the record just to make myself feel better.

I realize that during the course of my commissionership, and I was up in front of you gentlemen a lot—I never argued the case for public policy based on René Dubos' work with regard to any of the provisions of adequate diet for the disadvantaged, and I'm ashamed of myself. I clearly should have pressed much harder, Mr. Chairman, on that point.

It's scandalous that even now we provide nothing like an adequate basic diet even at the school age, or at the preschool age.

Mr. SCHEUER. I think it is shocking that I had to propose several years ago, a program of school breakfast that ultimately got passed. I had to label it as research and demonstration.

But in our society, in 1970, we had to label as research and demonstration the proposition that a kid will learn better in the morning if he has had a square breakfast, rather than if he is half asleep with his last decent meal being the school lunch the day before.

Now, let me return for a moment to your thoughtful comment that we probably can't and shouldn't try to justify postsecondary education just on a narrow cost-benefit analysis.

I wonder what the philosophical underpinnings were of the decision our society came to in the last third of the last century, when we established a public education system through grade 16—excuse me, through grade 12, through high school.

There must have been an appraisal on the part of the American public in the latter part of the 1800's, of necessary job skills that a person needed in a society with the then existing level of sophistication, the demands for ordinary good citizenship, and the ability to relate to the environment and the communities as they then existed.

Those demands, both the citizenship demands and the needs to have necessary skills in the 1800's, justified 12 years of education.

I wonder how we could structure a mathematical formula, saying that if grade 12 was relevant in 1890, both as to sophistication of skills needed in that society, and the complications and the challenges and the anxieties of life as they existed, then what would be the comparable level of education today that we would say today both that would fulfill the need for equipping people with job skills in an infinitely

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more sophisticated, cybernated, automated, computerized economy, and equip them—I think this was the second point you made—with simply the citizenship and the human development characteristics that would enable them to function well as citizens?

I don't know whether it would be 16 as opposed to 12 or maybe 10 years of graduate school piled on top of that, but I can't believe that if 12 years was relevant three-quarters of a century ago, that we wouldn't find that 14 or 16 years is at least the comparable minimum appropriate level of education, both as to job skills and as to citizenship.

Mr. KEPPEL. I wholly agree with what I understand to be the thrust of your comment, Mr. Scheuer.

While I obviously am not going to go on the enthusiasm that everybody should have 10 years of graduate study, I think that presumably that is the direct road to the neurotic——

Mr. SCHEUER. I agree with that.

Mr. KEPPEL. The argument of a general education for more than solely job is certainly an argument that was true for the secondary schools. It was argued by the proponents of secondary schools in the latter part of the 19th century and the early part of the 20th, and still seems to me a darned good argument, and an argument that is applicable to the extension of education, though I hope it will be a little more imaginative than we are now doing in higher education.

But the thing that worried me—and I am only repeating myself, Mr. Scheuer, forgive me for it—that if the rationale, and particularly if the rhetoric in support of higher education in the next 20 years is based, as I see it now being discussed all over the country, on the grounds solely of jobs and contributions to the growing economy, then I fear that we are endangering what is even the more important argument, which seems to be the one which you are making; namely, the argument of a general education.

Unfortunately, today it is very fashionable for pepole to say that the so-called general education movement in college, which you may recall was, let us say, particularly vigorous after the end of the second war, is one that is now fashionable to sneer at.

But in general, people don't want to use that argument any more. They say, "Ah, that's old stuff." It may be old stuff, but I hope to heaven it will be new stuff in the next 20 years.

Mr. SCHEUER. Amen to that.

Mr. BRADEMAS. I want to get to Dr. Dentler, but I don't get to Mr. Keppel as often as I would like to on these matters, so I have two other questions that I would like to put to you.

I have in front of me a paper, which I should like consent to have inserted in the record, by Dr. Rex Stockton of Indiana University, entitled "Research Management, a University Position," prepared for the American Education Research Association in Minneapolis, March 5, 1970.*

He touches on two matters on which I would invite your comment. Here are three or four sentences:

"Despite the faith felt in 1965 in the power of educational research to effect the immediate educational improvement, the results have been, at least to the general education community, disillusioning. The reasons for this lack of development can be cited. Education as a field of study has been slow in establishing links with other basic disciplines and relatively ineffective in gathering resources from the primary agents for producing and applying knowledge.

* See p. 185 for text of the paper.

The point you were talking about. Then Dr. Stockton goes on to say:

In schools of education in particular, there has been an emphasis on the university's role as socializer and distributor of credentials, rather than its function as catalyst for change within the individual and society.

Do you have any general observation to make on the role of schools of education as agents for change in American education?

Mr. KEPPEL. I believe I agree with the statement the gentleman from Indiana has made in that they have been on balance productive in the sense that their primary task is to recruit and train teachers to send out into the school systems.

And their record—and I can speak as a former dean of one—their record in basic research, or the addition to knowledge about human learning, has been relatively low.

I would have to point out that, of the scholars connected with schools of education in the last half century, there is only one name that I can think of to be regarded as a contributor to basic knowledge, and you could debate that one, and that is Thorndike of Columbia.

Mr. BRADEMAS. Just one other——

Mr. KEPPEL. It is an astonishing thing to have to say [laughter], but there it is.

So that if I understand the thrust of this point, it is that the strengthening of the basic scholarly side of those institutions is desirable, if I understand the thrust of that, and I completely agree.

Mr. BRADEMAS. Just one other point that Dr. Stockton makes: He says—if this is accurate—"From 1965 to 1968 that nine federally sponsored educational R. & D. centers received support of approximately $28 million."

That is absolutely shocking to me. I mean that is such a drop in the bucket.

So, my last question to you, before we get to Dr. Dentler, is: Do you have any judgment on how much money we ought to be putting into the NIE in terms of new money beyond what is presently expended through OE on research?

Mr. KEPPEL. Candidly, no, sir; I don't have this with any dollar sign on it.

I think that the ultimate test to which this financial institute has to refer is the test of the capability of the investigators, but an awful lot of money has been spread around on probably relatively unimportant tasks, and I don't feel close enough, sir, to know.

One thing does impress me: The Congress has already, as a result of action taken in the last 4 years through fellowships and the like, substantially increased the number of young investigators.

The situation is different in 1970 than it was in 1965, as a result of action devoted and taken.

I may say, Mr. Chairman, that is the reason why I have changed my position on the Institute, because the thing that concerned me the most was that you could have a lot of money and just pour it down the drain, unless there was somebody who was able to investigate. I don't have a measure, sir, of either the number of these younger investigators or the senior ones in the universities who can do it or if their quality is adequate.

I would suggest that there is something to be said for doing a staircase on this one, build it year after year slowly, but I only hope, sir,

munity leaders. Our impact, in keeping with the research and development tradition, goes far beyond what could have been accomplished by using the same dollar resources on direct services.

For example, we planned and helped implement the desegregation of several big city school systems, including Bridgeport and Harrisburg. We are an authoritative source of information and technical expertise on decentralization. We have trained hundreds of parents and community leaders to contribute to improving local public education. We are creating a home based curriculum with ghetto mothers. The resulting training materials. field tested in our community learning centers in the Bronx and Brooklyn, will be shared with parents and educators in a network of cities across the nation during 1972 and 1973. Curriculum products designed and tested at the Center are helping to revise social studies education in urban and suburban elementary schools throughout our region. Fourth and fifth graders working with our materials learn to identify neighborhood problems; to plan for constructive change; to respect cultural diversity; and to control the environment of the future.

We have also experienced directly the *limits* upon the potentialities of research and development in education. There are urgent problems facing education in America that *cannot* be solved via R. & D. The Center staff in writing the first draft of the Urban Education Task Force Report that became known as the Riles Report in 1969. for example, underscored the importance of R. & D. as a resource for invention and problem solving. But this occupied less than a tenth of the body of that report. The other nine-tenths went to matters of resource allocation, policy, and administrative reform. We would not change this balance in 1971. We only note that the report could not have been prepared without the aid of an R. & D. agency such as the Center.

Research and development functions do *not* extend to making policy, implementing it, enforcing public sanctions, redressing wrongs, or mediating conflicts. R. & D. will *not* prevent continuing erosion of public confidence in public education; it cannot stop the decay of authority relations between teachers and students: it cannot put vitamins in the stomachs of nutritionally deprived children; it cannot even ease the clash between old subcultures and new.

Nor can R & D tell decision makers what to decide; administrators how to administer; or teachers how to teach. Educational R & D should not be confused with physical engineering R & D. The Center's work is not analogous with the work of the Manhattan Project in designing and creating the atomic bomb in the early 1940's. People who sell educational R & D through such analogies are not people who have experienced urban social reality.

We have also learned that ever-improving concepts and methods will *not* transform the prestige that is accorded educational R & D within the American culture or its academic subculture. The suggestion that educational R & D is on the verge of an "intellectual breakthrough" of the kind represented by nuclear physics in the 1920's, or biochemistry and its DNA in the 1960's, is a peddler's suggestion.

As we see it, our Center and a National Institute alike offer opportunities for *applying* breakthroughs from the sciences and good ideas from the arts and humanities to the institution of teaching and learning. This business of making applications to education has been going on for a long time. The only leap offered by the R & D approach is an organizational leap, not what is called a quantum leap in the rhetoric of original discovery.

That is our humble pie. We have baked it in the ovens of neighborhood schools in big city ghettoes and affluent suburbs. We have sampled it in the midst of school boycotts, protracted teacher strikes, and financial breakdowns. We have learned that it is wrong, intellectually and morally, to make excessive claims for the potentialities of educational R & D.

But we have found the meaningful, positive plums of great prospect, as well. As I list these, I want to point up the contribution a National Institute could make to each.

First, educational R & D can record events, identify problems, weed out factors of lowest relevance, and illuminate alternative solutions to limited problems. This is the oldest, surest function of R & D. It cannot be managed well under a line agency like the Office of Education. It needs to be de-politicalized and stabilized, although it need not be fur-lined or famous. Although we have completed hundreds of empirical reports, much of the Center's best recording, forecasting, and illuminating of events has been broken up from year to year as a result of zigs and zags within the White House, HEW, and USOE. The best continuous

research auspices within the Federal sphere have been, in my estimation, the National Science Foundation, and the National Institutes of Health. A National Institute of Education is overdue for this reason of stability alone.

Evaluation research is a second function within the purview of educational R & D. From 1966 to 1970, our Center conducted more than 150 evaluations of educational programs external to our own projects, and dozens of evaluations of our own development projects. Obviously, we filled a standing, growing demand for independent, planful studies of program effectiveness. That demand will never be met by universities and colleges alone. Evaluation will always be subordinated to the disciplines. A National Institute of Education must therefore build up capability for the conduct of evaluation research, within itself and contractually across the nation. Our work has shown the weaknesses of Title I projects in compensatory education and pointed ways to remedy them. This achievement must be coordinated nationally to make a great difference, however. Evaluations most often carry hot coals to agency Newcastles. Our experience is that they are avoided, suppressed, or distorted, by line agencies. A National Institute could detach from the line agency in a way that is essential.

As a laboratory, the Center has specialized increasingly in *inventing alternatives* to policy and practice. The U.S. Office of Education staff has been courageous in giving emphasis to development in this and other laboratories and centers. Office staff have shown a grasp of what should be taking place nationally.

The cross-pressures on them have also proved unbearable in this respect however. Fashions shift with the seasons. Interest groups intrude their preferences. Failure, the quintessence of invention, tends to become unacceptable. Zaniness, invention's temperament, gets frowned upon. Imagine Thomas Alva Edison at age 30 under annual contract to a public line agency, and you have the picture minus his light bulb.

I believe that great stress should be put upon invention and development work generally under a National Institute of Education, but this stress should not be for warranteed delivery results in one year. If the stress goes there, triviality will be the harvest.

Inventions should be *field tested* in real American schools, communities, and homes. The Center has learned that educational field testing is possible even under crisis. A National Institute is necessary, however, to fix technical standards for testing. The marketplace of educational ideas is a blizzard of false claims and phoney evidence. No line agency involved in administering more than four billion dollars worth of human as against physical or mechanical services can see clearly through the blizzard.

An educational laboratory also *demonstrates* the potentialities of its tested inventions. In a decentralized system of education, demonstrations cannot be left to a small line agency with a large budget. Too much hedging occurs. Too little believability builds up among state and local users. A National Institute of Education would give auspice to demonstrations; to bring together diverse users, nationally and regionally, in mutual trials and exhibitions.

Knowledge, inventions, tests and demonstrations must be *communicated* from R & D agent to user, to agent again. A National Institute would make selected communications highly authoritative. It could also fund and account for diverse mechanisms of communications.

The ERIC system is a superb example of mechanism. Others fostered by the Office of Education could be cited. But that agency has, as do other federal line agencies, a rather fixed circle of constituents. A National Institute of Education could encircle the entirety of the interested public and it could join in international communication with greater facility than can a line agency.

These roles for educational R & D seem to me to be indisputable, if finite and unglamorous. Our Center experience has been that these roles are so intertwined as to *have* to be carried on within every laboratory. This would prove true of a National Institute, and that such an institute would help ensure it for its contracting partners.

The Office of Education has not done this. It has singled out functions—parceled out policy studies and forecasting to one agency, evaluation to another, and development to others. Its approach has added to the roaring cacophony of knowledges about education.

Harold Orlans of the Brookings Institution recently wrote, "If, as the 'establishment' avers, the social sciences (are) all that helpful to rational government, our not entirely irrational government would have recognized that fact and we would be beset by fewer social problems. And if, as the radicals contend, the

social sciences were really so helpful to government, the latter would rule far more effectively than it does." To paraphrase, if educational R & D, at its very best, were all that helpful to teachers, learners, and policy makers, these parties would have recognized that fact by now and we would have more significant change by far than we presently enjoy in American education.

Within this limitation, a National Institute would greatly improve the knowledge yielded for the cost; it would offer a countervailing framework within the contentious marketplaces of American education; it would enable those of us who carry the buckets from this small well to carry them confidently and well. Good education in the large sense, however, reflects the culture and its policy. I will trade all the R & D we have for peace, racial justice, and domestic economic security. This is not, however, a rational basis for considering the N.I.E.

Dr. DENTLER. The Center for Urban Education was the first independent nonprofit research and development institution to be formed in response to the mandate of the Congress under title IV of the Elementary and Secondary Education Act.

We have incorporated, in January of 1965, and first contracted with the Office of Education in September of 1965.

Mr. SCHEUER. I think you beat us to the punch in getting the law passed [laughter]. That is excellent forward planning.

Dr. DENTLER. The board of trustees of the Center deliberated and strongly endorsed the original proposal to establish a National Institute of Education last year.

I want to illuminate that endorsement this morning by drawing on our experiences in operating this laboratory.

We feel that we have learned much in our first 6 years and over the course of expending more than $15 million, most of it from the Federal and State public sector on educational R. & D., that could be applied to the case for a National Institute for Education.

Like the work of our sister laboratories and centers across the Nation, our work, we believe, has made a difference in the lives and learning of teachers, students, and community leaders.

Our impact goes far beyond what could have been accomplished by using the same dollar resources on direct services.

What I am going to mention, I mention in order to underscore what we think the R. & D. approach can address and what it cannot.

And I have put in the record some notes on the projects we have completed and the projects we are carrying on. I won't bore you with that inventory at the moment.

Mr. BRADEMAS. It is very impressive, let me say.

Dr. DENTLER. In the course of this project experience we have also experienced directly the limits upon the potentialities of research and development in education.

Now I wish to stress this because it seems to me that some of the argumentation underlying the case for the NIE has as its traditional rhetoric about education in the United States overstated the possibility and overextended the claims that should be made for the research and development approach.

We submit from our experience that there are very urgent problems facing education in America that cannot be solved through research and development.

The center staff wrote the first draft of the urban education task force report that became known later as the Riles committee report in 1969.

This report since liberated by the Congress [laughter] underscored the importance of research and development as a resource for invention and problem solving. But our draft and the draft of the committee report that finally emerged, revealed that R. & D. occupied less than one-tenth of the body of that report. The other nine-tenths went to matters of resource allocation, policy, and administrative reform.

We would not change this balance in 1971. We would only note that such a report could not have been prepared without the aid of a research and development agency such as this center.

R. & D. functions, we submit, do not extend to making policy, to implementing it, to enforcing public sanctions, to redressing wrongs, to delivering justice or to mediating conflicts.

R. & D. will not prevent continuing erosion of public confidence in public education. R. & D. cannot stop the decay of authority relations between teachers and students. R. & D. cannot put vitamins in the stomachs of nutritionally deprived children. R. & D. cannot even ease the clash between old subcultures and new.

Nor can R. & D. tell decisionmakers what to decide, or administrators what to administer, or teachers how to teach.

Educational R. & D. should not be confused, in spite of the seductive temptations of the line of reasoning, with physical engineering R. & D.

The center's work is not analogous with the work of the Manhattan Project in designing and creating the atomic bomb in the early 1940's.

Although the first public relations consultant we hired in 1965, thought that that was the best lead paragraph he wrote, we remained convinced that we were right in scratching it from the release.

People who sell educational R. & D. through such analogies are in the light of our experience not people who have experienced social reality.

We have also learned that ever-improving concepts and methods in education will not transform the prestige that is accorded educational R. & D. within the American culture, or even its academic subculture.

The suggestion that educational R. & D. is on the verge of what one testifier called an intellectual breakthrough of the kind represented by nuclear physics in the 1920's, or biochemistry and its DNA in the 1960's, is in the light of our experience a peddler's suggestion.

As we see it, our center and the National Institute alike, offer opportunities for applying breakthroughs from the sciences and good ideas from the arts and humanities to the institution of teaching and learning.

This business of making applications to education, of course, has been going on for a long time. But the only leap offered by the educational R. & D. approach is, we believe, an organizational leap, not what is called a quantum leap in the rhetoric of original scientific discovery.

In this connection. I would like to remark, that this morning you have joined the issue twice of the in-house work of the National Institute of Education and cautionary notes were entered concerning the importance of subcontractors distributing the work, not merely coordinating it and initiating it, giving it auspices from the headquarters.

We would emphasize that a substantial headquarters staff would be a requisite for a National Institute which had applications, or the distribution of inventions, as its objective.

And I just wanted to put that note in.

If you were going for an emphasis on a quantum leap in scientific discovery, of course, you might reverse this balance.

We submit that we have learned from the ovens of neighborhood schools in big city ghettos and from the refrigerators of affluent suburbs that it is wrong, intellectually and morally, to make excessive claims for the potentialities of educational R. & D.

But we have also located some meaningful, positive prospects, and I would like to quote you some of those.

First, as you well know, educational R. & D. can record events, identify problems, weed out the factors of lowest relevance, and illuminate alternative solutions to limited problems.

In this connection I agree with the testimony given on a previous occasion by Professor Moynihan that the greatest powers of research in the case of education have to do with the identification of what does not matter and factors that are immaterial, or approaches that don't work.

I submit to you that that is a humble role to play out, but it is a critically valuable one, nevertheless.

Now, research is the oldest, surest function of the R. & D. tradition. It cannot be managed well under a line agency like the U.S. Office of Education. It needs obviously to be depoliticalized and stabilized, although it need not be fur-lined or famous.

Again, I would like to comment on my own record here and indicate that we would urge from our experience against the tendency to blow up, make too comfortable in advance, make too prestigious and chromium-plated the National Institute of Education.

We have completed hundreds of empirical research reports at the center, but much of the center's best recording, forecasting, and illuminating efforts have been broken up from year to year as a result of zigs and zags within the White House, HEW, and USOE.

The best continuous research auspices within the Federal sphere have been, in my estimation, the National Science Foundation and the National Institutes of Health.

A National Institute of Education is overdue for this reason of detachment from a line agency for this reason of stability alone.

Evaluation is a second function within the purview of educational R. & D. From 1966 to the present, our center conducted more than 150 evaluations of education programs external to our own, as well as dozens of studies of our own development projects. We filled a standing, growing demand for independent studies of program effectiveness.

That demand will not be met by universities and colleges alone. The university's role is the service and furtherance of the basic disciplines in the community of scholars.

Evaluation will always be subordinated to the disciplines. However, I would depart from or dissent from the point of view of Mr. Keppel in this connection, and submit that a National Institute of Education, for this very reason of the university's limitations, must build up capability for the conduct of evaluation research within itself and contractually across the Nation.

Our work at the center has revealed the weaknesses of title I projects in compensatory education and pointed up ways to remedy them.

This achievement, however, must be coordinated nationally if it is to make a great difference.

Evaluations, as Mr. Keppel noted, usually carry hot coals to agency Newcastles. Our experience is that they are avoided, suppressed, or distorted by line agencies.

We have had the experience of submitting reports to the State Education Department and the U.S. Office of Education, for example, showing that the more effective school program, an outstanding example of title I expenditures, does not have effect on academic achievement, only to have another division inside the Office of Education publishing brochures explaining that the more effective school program is more effective in increasing achievement.

A national institute could interject authority here and could detach the matter from the line agency in a way that is essential.

As a laboratory, the center has specialized increasingly in development or in inventing alternatives to policy and practice. The Office of Education has been courageous in giving emphasis to development work in this and sister laboratories and centers. Office of Education staff have shown a consistent grasp of what should be taking place nationally to build up an educational development endeavor.

But the cross-pressures on the Office of Education have proved unbearable on many occasions in this respect for fashions—policy fashions—shift with the seasons.

Interest groups intrude their preferences. Failure, which we submit is the quintessence of invention, tends to become unacceptable.

Zaniness, which is the temperament of invention, gets frowned upon inside a line agency and across the interest group establishment.

Imagine, if you will, Thomas Edison at age 30 under annual contract to a public line agency, and you have the picture minus his light bulb.

I think that great stress should be put upon invention and development work generally under a National Institute of Education, but this stress, however, should not be for warranted delivery of results in 1 year, the kind of stress that has been put upon the line agency in the Office of Education.

For if the stress goes there, triviality will be the harvest.

In this connection, I want to agree with Harold Howe in suggesting that research, development, evaluation, and dissemination are part of a continuous spectrum.

I want also to urge that the differentiation between basic research as socially and academically desirable and development work as something going on among lesser mentalities, a theme which tends to crop up in the literature around R. & D., is a motif that should be fought against in the founding, in the enactment of the National Institute of Education.

Our conviction is that when Thomas Edison emerges from educational development, the balance between development and research will be restored, that in our view, research should be in the service of invention and problem solving.

Another function of R. & D. that has great potentialities is field testing of inventions. We have learned at the center that field testing should be in real schools in American communities and in American homes.

We have learned that educational field testing is possible even under crisis situations. A national institute is necessary, however, to fix some

technical standards, to establish canons of evidence, and common criteria for field testing.

For the marketplace of educational ideas is a blizzard of false claims and phoney evidence.

No line agency, however courageous, is involved in administering more than $4 billion worth of human as against physical services can see clearly through such a blizzard, unless some standards of evidence are being established along the route.

Now, an R. & D. laboratory also functions to demonstrate the potentialities of inventions. Demonstrations in a non-nationalized system of education, like the American, cannot be left to a small line agency with a large budget, for too much hedging of demonstration bets occur and too little believability builds up among State and local users.

A national institute would give auspice to demonstrations to bring together diverse users in mutual trials and exhibitions.

Another function of R. & D. that has great potentiality is the communicating of knowledge invested in inventions, tests, and demonstrations.

A national institute would make some communications its best findings, its best demonstrations, authoritative in their dissemination. It could also fund and account for diverse mechanism of communications.

Here is an opportunity to reach citizens as distinguished from professionals.

The ERIC system is a superb example of a communications mechanism. Others fostered by the Office of Education since 1965 might be cited. But that agency has, along with other line agencies, a rather fixed circle of constitutents.

NIE could encircle the entirety of the whole interested public. It could join in, as Harold Howe noted, international communications with greater facility than can a line agency.

These are the roles for educational R. & D. in our estimation. We think they are indisputable; we think they are a part of a continuous spectrum. We also think they are finite and ultimately unglamorous.

Our center experience has been that these roles are so intertwined as to have to be carried on within every educational laboratory center. I think this would prove true of a national Institute, and that such an institute could insure that the spectrum was preserved.

I would like to point out that the Office of Education has been unable to do this. It has instead had to single out functions; it has parceled out policy studies to one center, forecasting to another, to another studies of the future, evaluation to others, and development to others. Its approach has added in this respect to the roaring cacophony of knowledges about education.

Harold Orlans of the Brookings Institution, a political scientist with whom I disagree on almost everything else, recently wrote, and I quote:

> If, as the "establishment" avers, the social sciences (are) all that helpful to rational government, our not entirely irrational government would have recognized that fact and we would be beset as a people by fewer social problems. If, as the radicals contend, the social sciences were really so helpful to government, government would rule far more effectively than it does.

To paraphrase Mr. Orlans, if educational R. & D., at its very best, were all that helpful to teachers, learners, and policy makers, these

parties would have recognized that fact by now, and we would have more significant change by far than we presently enjoy in American education.

It has been our experience that we have found parents, taxpayers, teachers, and even school administrators concerned to locate workable inventions, concerned to try them out in concert with us, rather than to resist possible inventions leading to change.

What we think we are missing is the light bulb or George Washington Carver's peanut.

Within this limitation, which I am trying to emphasize, a National Institute would greatly improve the knowledge yielded for the Federal cost; it would offer a countervailing framework within the marketplaces of American education; and it would enable those of us who carry the buckets from this small well to carry them better than we have in the past.

But good education in the larger sense, reflects the culture and its policy. I will trade all the educational R. & D. we have in exchange for more peace, for racial justice, and for domestic economic security. This trade, however, is not a rational basis for considering the merits of the National Institute of Education.

I have brought it forward; I have tried to raise the dragon in the interest of setting him apart and focusing on what R. & D. is capable of, and which we believe is considerable.

Mr. BRADEMAS. Thank you very much, Dr. Dentler.

May I say that what particularly impresses me about your statement is the refreshing sense of limitation that characterizes it.

We are usually confronted with hyperbole and all grand manner of claims for any particular program that is brought before our committee, and I am all the more impressed by your indication that R. & D. isn't going to cure all the ills of mankind.

I just have two quick questions.

You used the phrase, with respect to the NIE, that it ought to be detached from a line agency, specifically from the Office of Education.

Then, on page 8 of your statement, you remarked on how the Office of Education had parceled out its various functions.

Can you give us any comment then on the problem that we have earlier discussed, the relationship between the NIE and the Office of Education; who reports to whom, and what kind of problems might arise out of that relationship?

Dr. DENTLER. Mr. Chairman, I think it is a cost benefit problem; that there is much to be gained by direct accountability to the Department Secretary through direct reporting to the Education Commissioner.

And there is something obviously to be lost in this.

I would not come down about this matter. I think that the H.R. 33 version is adequate; it is as good as I would know what to do on this question.

There is as much danger in being disconnected as there is in being over-attached.

I have worked some while for the Social Security Administration and its Office of Research and Statistics, which is one of the oldest in the domestic economy. This Office reports directly to the Social Se-

curity Commissioner. This has not hampered its work. It has a distinguished record of research and planning contributions.

It depends on the caliber of their people.

Mr. BRADEMAS. I must say I find that a very impressive analysis of the problem, that you want independence to insure innovation. And on the other hand, you don't want to be so far removed from what is actually happening that you are not relevant; Dr. Dentler, if you haven't resolved the problem, I think you have put it very well.

My other question is simply one of definition. You listed the various activities which R. & D. could undertake; among them you listed field testing and demonstration.

What is the difference?

Dr. DENTLER. That's a good question.

Field testing is the developer's word for what he does in the course of trying out an invention or a set of alternative practices or materials. And he uses field testing to make revisions. He redesigns his alternatives in the light of the effects and the information brought in by users and participants.

Demonstration is something else again. We submit that a demonstration in the main should take place when tested products and practices are hard at hand.

There has been some confusion in this connection and we think that an institute would help to sharpen up the models of distinctions here.

Substantially the theory of educational R. & D. is itself only now emerging, and could be greatly facilitated by the NIE.

Mr. BRADEMAS. I'm learning that more and more.

What has struck me at these hearings so far is that different phrases have different meanings for different people, therefore, when you issued the warning about making too easy an analogy between research and development in the hard sciences, and research and development in this area of human behavior, I think that is very useful, because I'm getting an education on the meanings of the words "research, demonstrations, experimentation," and so on.

I think if we could sharpen up our definitions, we would probably be more understanding as legislators, and we would probably be more intelligent in our questions both to administration witnesses, who sometimes, I think, fear we are being overly combative, when we are trying really only to understand what the words mean.

Mr. Hansen?

Mr. HANSEN. Let me echo the chairman's comment, and I wish I had your perspective on education.

I was particularly impressed with your emphasis on the need to develop capacities for evaluation research within the Institute.

Turning to another area, of what has been more or less in-house type of research, what role do you see for the national laboratories, the regional laboratories, and other federally supportive research centers in the NIE?

Dr. DENTLER. There are two questions you are asking, though I think they are integral.

Let us take them one at a time. On the matter of in-house staffing, I wish to submit that educational development will begin to be a distinguished enterprise in the United States, when able young people and experienced older practitioners and policymakers step up to it and

commit themselves to this profession. I submit it is an emerging profession.

And the only way to do this is to build a cadre of durable professionals. And as one who has worked in the civil service, worked in some line agencies, or research offices, I am not that impressed by the distinction between Washington, D.C., and its surrounds and the seven university campuses.

I submit wisdom and ignorance are very randomly distributed in the United States and originality is not located on the campuses.

There is a difference between the educational development requirement and the scientific community in the sense that physics, biochemistry, biophysics, are grounded in 500 years of accumulating knowledge and etymological precision. And they can draw on the world community with some ease.

In the case of application of educational research and development, a community is just being born. And that community has to engage in the painful carrying of those evaluation coals to Newcastle. It's got to submit to the crossfire of testing external programs, and not stand off from it and say that's an unpleasant task.

So I would envision—I would urge provision of a headquarters staff at the National Institute that is committed to this as an emerging profession, that sees it as a long-term enterprise.

It's not a matter of an occasional sabbatical or postdoctoral think-tank occupant. That is valuable, but that goes on somewhere else.

In that connection I believe that the last 5 years of congressional support and the Office of Education commitments in the administration has laid a basis for an emerging profession, and that the R. & D. centers, the laboratories, and similar quasi-nongovernmental agencies, some of them lodged in colleges, some of them even in State education departments, become the external network which should in part define its own objectives and be sustained by Institute funding, and in part should serve directed enterprises undertaken by the staff of the Institute under the Advisory Council.

But I am very wary of the consortium approach. In our first year and a half at the Center we gain as a very research-oriented university consortium; and while that is valuable in its own right, it fits the model of the sciences much more readily than its does education, and we turn more to the shop model for a staff to build up some competence, because it is a different condition and requires people who will commit themselves to it and learn as they go.

In that connection, by the way, as one who has been for 20 years on university faculties, I would suggest to you that the evaluation and vital aspects of development work will never have priority on the university agenda, and they have to be given a different auspice.

Mr. BRADEMAS. Thank you very much.

Mr. Scheuer?

Mr. SCHEUER. Dr Dentler, I want to thank you for one of the most carefully thought through and disciplined presentations we have heard in a long time. It is enormously helpful.

Mr. BRADEMAS. I would echo that observation by Mr. Scheuer. It's been really very, very helpful to us in our thinking, and again we are grateful to you for the hospitality of the Center for Urban Education, Mrs. Badillo, and Dr. Elsbery.

And we thank again, Mr. Keppel and Mr. Howe. I think my colleagues would agree this has been a most valuable hearing for us today, and we shall try to draw what we have learned today to the attention of our colleagues on the subcommittee.

Now we are adjourned.

(Adjourned at 12:45 p.m.)

(The following paper was submitted for the record:)

RESEARCH MANAGEMENT: A UNIVERSITY POSITION

(By Rex Stockton, Indiana University, Bloomington, Ind.)

Throughout the university's evolution as one of the basic institutions of western civilization, certain fundamental aspects of it have remained stable while others have changed as society has. Martin Trow comments that until recently the university has addressed itself mainly to its traditional and autonomous functions, which are those which remain relatively stable and include the preservation and transmission of high culture, the shaping of the individual's psychological and intellectual development, the creation of new knowledge, and the issuance of social credentials.[1]

In the pragmatic American fashion, the university has become increasingly visible as an active agent in determining the shape and character of society at large. As Ralph Dungan, Chancellor for Higher Education of New Jersey, has expressed it, "in recent years the university has become part of the adaptive system of society and has assumed a more active role in determining the course that society will follow."[2] The very knowledge that is discovered, stored, permuted and created effects change, for knowledge alters people and therefore society, and society in turn alters the pressures and demands made on the university.

Since World War II, national government, in part in response to pressures of societal unease, has intensified its efforts to perfect an interface between institutions of higher learning and our national goals. In the case of education, the Elementary Secondary Education Act of 1965 was partially a recognition of the importance of educational research. The resulting training of researchers, support of individual and project research, and the creation of research and development centers were manifestations of a national concern for the improvement of public education.

Despite the faith felt in 1965 in the power of educational research to effect immediate educational improvement, the results have been, at least to the general education community, disillusioning. Reasons for this lack of development can be cited. Education as a field of study has been slow in establishing links with other basic disciplines and relatively ineffective in gathering resources from the primary agents for producing and applying knowledge. In Schools of Education in particular there has been an emphasis on the university's role as socializer and distributor of credentials rather than its function as catalyst for change within the individual and society.

The relatively bleak research picture in education and in educational research certainly should not surprise any thoughtful observer because, among other reasons, funds in amounts adequate to generate powerful forces for change have simply not been forthcoming. The federal budget for research education now, for example, is only three-tenths of one percent of the nation's entire budget for education. Ten percent of the defense budget, however, is devoted to research, five percent of the health budget, and four to five percent of the budget for business and industry.[3]

Or, to view the situation from another angle, from 1965 to 1968, the nine federally sponsored educational R & D centers received support of approximately

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[1] Martin Trow, "Reflections on the Transition from Mass to Universal Higher Education," Daedalus: Proceedings of the American Academy of Arts and Sciences, Winter, 1970, Vol. 99, No. 1, pp. 1–42.

[2] Ralph A. Dungan, "Higher Education: The Effort to Adjust," Daedalus: Proceedings of the American Academy of Arts and Sciences, Winter, 1970, Vol. 99, No. 1, pp. 141–153.

[3] James L. Gallagher, "Education Research Push," Education-Training Market Report, January 30, 1970, Vol. 4, No. 3, p. 1.

$28 million. Just as a measure of the extreme modesty of this sum as the total support for nine centers over a four-year period, at my own university $8.2 million is being spent on a single item of scientific equipment, a cyclytron; a highly sophisticated item, admittedly, but the point is valid nevertheless; $28 million represents only a token commitment to the success and efficacy of these centers.

Therefore it is not surprising that no sweeping reforms have resulted from research and development activities to date, although considerable publicity has fostered the expectation that they would. This problem can be ameliorated if funds are available in sufficient amounts to multiply significantly the amount of contemporaneous university research activity underway. However, a most important point is that money—even in overwhelming amounts—will not purchase significant educational research and development. Later in the paper I will discuss those components which in my opinion must be combined with financial resources to produce meaningful educational research.

In spite of the fact that educational research is being carried out successfully and well by agencies other than universities, the university, because it is a vast, multi-faceted institution with a nerve center in contact with almost every aspect of society, should remain at the heart of educational research and development. Later I shall speak of the importance of interdisciplinary effort. I shall also speak of the importance of powerful models and theories to unite the efforts of these workers. Again, it is in the university where one finds the richest intellectual resources for formulating these models and theories.

In the university exists a pool of scholarship and expertise such as cannot be equalled or easily duplicated at any other institution. Universities, as perhaps no other institutions, have a large vested interest in the improvemen of America's educaional system, for the university's own clientele are the product of that system. "A first-rate university," remarks Peter Caws, "can only be the apex of a first-rate education system," and he goes on to estimate that the rest of the system taken collectively is about fourth-rate.[4]

Under these circumstances, obviously, one part of the system cannot flourish without a general reform throughout. The university—and I am speaking here of the total institution, not merely that part of it devoted to the education of teachers—has every reason to put full heart and energy into bringing about the best possible educational system on all levels and for all individuals throughout life.

I offer these points less as conclusive arguments than as facts of life, posited as preliminary to the rest of my discussion, which is not a defense of the university as locus for educational research and development but an exploration into ways in which this function can be dispatched most effectively. My remarks will now be concerned, first, with basic research and then with the nature of mission-oriented research in the university, followed by a consideration of research and development in the field of education.

The Importance of Basic Research

Basic research in education, which has been notably deficient up to the present, must be expanded into a major professional concern if schools of education are to develop beyond the level of trade schools. I have already noted the low level of funding, a weakness compounded by a pattern Swanson has pointed out. He notes, "in the field of education, research has only a fragment of a small proportion [of the responsibility of] those in academic teaching careers. . . . The consequences are huge gaps in fundamental knowledge about education and educational practice. This is a reflection of the recency of research in education and its low priority either as a national goal or as an obligation of the academic community."[5]

The fact that schools of education are limited in what they can accomplish in basic research, due partly to limited funds and partly to necessary emphasis on practical research, underscores the importance of their establishing ties (within their institution) with other disciplines which have achieved a considerable fundamental research base, particularly the biological and behavioral sciences. Close interdisciplinary academic contact is one of the education school's most valuable assets as part of the larger university complex.

Since its beginnings, the university's main business has been the cultivation of ideas. Mission-oriented research is viable only if its point of departure is securely based on fundamental research. To define the mission one must know

[4] Peter J. Caws, "Design for a University," Daedalus: Proceedings of the American Academy of Arts and Sciences, Winter, 1970, Vol. 99, No. 1, pp. 84–107.

[5] Gordon I. Swanson, "A Rationale for a National Research in Education," Organization for Research and Development in Education: Proceedings of a Conference Sponsored by the American Educational Research Association and Phi Delta Kappa, 1966, pp. 83–89.

the problems, and to know the problems one must conduct or be in touch with basic knowledge.

Mission-Oriented Research

Francis Chase has identified five characteristics essential to mission-oriented research: (1) key individuals within the research organization who are fully aware of and sympathetic to the principal goals of the organization (or institution) while working within a broad definition or the mission itself; (2) ready mobility between the fundamental research and its application as well as across disciplinary lines; (3) receptiveness to new ideas and readiness to act quickly on those judged sound and promising; (4) reasonable freedom for individual deployment and redeployment of resources; and (5) full communication of involved personnel throughout all stages of the R & D process, from original research through its ultimate applications.[6]

These characteristics suggest a picture quite different from the old stereo-type of the lone researcher encapsulated in his laboratory and communicating with the pure essence of knowledge. Indeed, Chase goes on to say that "the essential character of research and development is in the reciprocal interactions of its component processes and in the interactions of the total R & D system with the particular systems it is designed to effect." A powerful system of R & D development for education requires many institutions and agencies. The importance of the university role is stressed by Chase when he states that universities can codify knowledge, identify knowledge gaps, draw theoretical inferences, construct models, and design and test experimental procedures.[7]

Fitting the problem into a larger theoretical construct which become the affair of a large and varied group of researchers, that abstracting from it a major problem field is one main concern of educational research. On the other side of the coin, the problem of translating research into development and application—of making it concrete through practical application—is equally urgent. Launor Carter has very usefully summarized a critique made by a team studying the development of a ——— system which might also be used as guidelines in evaluating the transition process in Educational R & D.

"1. The transition from research to development to use is not a straight forward, orderly process. . . .

"2. There is usually a large time lag between initial discovery and practical application. . . .

"3. Communication in research and development tends to be informal and largely on a person-to-person basis. . . .

"4. Ideas are pushed through to application at the location at which ideas originate. . . .

"5. Strong leadership is essential, but an adaptive rather than authoritarian organizational environment is equally important. . . ."[8]

These observations imply that such devices as organization charts, schedules, information circulars, and reports are likely to be much less impressive in practice than they are on paper. Strength of leadership in the sense of personal dynamism and the ability to communicate enthusiasm and commitment as well as information are important. Related to this type of leadership is the adaptive environment, by which the study team meant that "authority was not based on position in the hierarchy but on the expertise with regard to the task at hand. Critical decisions were not confined to the top but were diffused throughout the organization according to the ability of each person to contribute his knowledge or talent to the job toward which the organization was dedicated."[9]

Mission-oriented research, in summary, requires an overall plan and commitment, team approaches to problem solving, attention not only to actual problems themselves but also to models and theories on the one hand and practical field testing on the other, dynamic leadership, decentralized authority, and a communication flow which is not confined to channels. I shall now speak more specifically on mission-oriented research in the field of education.

Mission-Oriented Research in Education

Mission-oriented educational research will, inevitably, directly involve university people with groups outside the university setting—the public schools, regional laboratories, and model cities programs, to name a few of the meeting

[6] Frances S. Chase, "Education R & D: Promise or Mirage?" Journal of Research and Development in Education, 1968, Vol. 1, No. 4, pp. 3–14.
[7] Frances S. Chase, Ibid.
[8] Launor F. Carter, "From Research to Development to Use," Organization for Research and Development in Education: Proceedings of a Conference Sponsored by the American Educational Research Association and Phi Delta Kappa, 1966, pp. 43–44.
[9] Launor Carter, Ibid.

grounds which provide a rich culture for the development of misunderstanding, mistrust, and misdirected efforts. It is not surprising that nonuniversity personnel would feel defensive at the presence in their "territory" of "experts" from another level of education whose legitimacy in terms of socially acknowledged credentials is greater than their own. One very fortunate development in education today has been the professional separation of public school and higher education personnel, the latter frequently convinced that they are the true professionals while the former believe that they must labor in the fields while others reap the rewards of recognition, higher salaries and easier jobs, a conviction which is too often reinforced by poor communications.

In spite of certain friction between the public schools and university educators, there are developments in education today which require the cooperation of all educators for vigorous study. For example, significant policy decisions are being made regarding the governance and financing of schools, characteristically without adequate reference to theoretical models or experimentation. A further example is the fact that the lip service paid to the value of educational hardware vastly outweighs development and experimentation with such. Finally, many techniques, such as human relations training, whose potential surely interests anyone who has been concerned with teacher attitude, are being practiced without adequate, controlled experimentation.

Turning from what ought to be done to what is now taking place, we can view the nine federally sponsored university based centers as a major example of mission-research in education and as a tentative but positive thrust.

A very recent trend is occurring on many more campuses besides those which host the national centers, where individual researchers and research teams are also working on projects whose spin-off will eventually increase the composite research effort and information base in education. Across the nation, within the field and in conjunction with other disciplines, education faculties are making connections with outside agencies, including school districts, social agencies and independent laboratories, effecting cross-institutional collaboration in addition to interdisciplinary efforts within the institution.

A final point concerns the importance of planning for success in educational research and development, which extends into the planning for overall institutional development that should be a major factor in the determination of research goals. It is to the institution's advantage to think of the research enterprise as something more than just another of the many units within the university. The major point to be made in this regard is that research funds in substantial amounts, particularly when allocated to projects involving several members or inter-disciplinary effort, can be used to shape departmental and institutional development. With informed awareness of possibilities and intelligent planning for results, the growth and development of a program could be telescoped, accomplishing in a few years what might require decades at established rates of institutional growth.

None of this is possible, however, neither the planning nor resulting institutional growth, unless adequate funds and reasonable freedom to deploy them are made available to researchers in education.

In a number of ways, the federal government has acted to stimulate and support research on the campus without strictly categorizing the funds made available. Historically, these non-categorical funds have been given to disciplines other than education, allowing them to develop a richer pool of resources for future arrangements. Until quite recently, on the other hand, funds for educational research have generally been marked when allocated, providing little flexibility for institutional development following natural growth patterns.

In conclusion, two points I wish to make are that we need to be neither surprised nor discouraged by the shortcomings of educational research. We need not be surprised at them because we have viewed the funding problems both in terms of magnitude and flexibility, the slow-to-emerge tradition of scholarship, the lack of linkage between universities and other institutions, and lack of adequate planning. On the other hand we need not be discouraged because some of the more established disciplines with now firmly rooted traditions of research and scholarship went through similar experiences before realizing their present day status. Much more significantly, there is evidence in very recent times of movement in the direction of solutions of these problems of educational research and development in the university.

I believe, with Chase, that properly conceived, supported, and directed research and development can contribute both to continuous and cumulative improvement and to institutional reconstruction in education. I further believe that the university will play a key role in this endeavor.

TO ESTABLISH A NATIONAL INSTITUTE OF EDUCATION

WEDNESDAY, MARCH 23, 1971

HOUSE OF REPRESENTATIVES,
SELECT SUBCOMMITTEE ON EDUCATION
OF THE COMMITTEE ON EDUCATION AND LABOR,
Washington, D.C.

The Select Subcommittee on Education met, pursuant to call, at 10 a.m., in room 2175, Rayburn House Office Building, Hon. John Brademas (chairman of the select subcommittee) presiding.

Present: Representatives Brademas, Meeds, Mazzoli, Quie, Reid, Bell, and Hansen.

Staff members present: Jack Duncan subcommittee counsel, David Lloyd-Jones, staff, Martin LaVor, minority legislative associate, Gladys Walker, clerk, and Christina Orth, assistant clerk.

Mr. BRADEMAS. The subcommittee will come to order.

The Select Subcommittee on Education will continue hearings on legislation to establish a National Institute of Education.

We are particularly pleased to welcome as our witness this morning Dr. Roger E. Levien, the director of the planning study for the National Institute of Education. Dr. Levien is with the Rand Corp. and he has been laboring very diligently for some time now under commission of the Office of Education to devise a proposal for the dimensions and structure of the National Institute of Education.

As one who has read his study, I must congratulate you, Dr. Levien, on what has clearly been a very diligent and thoroughly perceptive effort on your part, to talk to all sorts and conditions of persons in seeking to shape a proposal that will enlighten both the administration and us on this subcommittee and thus Congress generally as we consider this significant proposal.

We look forward to hearing from you and we congratulate you on your very important contribution to our understanding of this proposal.

STATEMENT OF DR. ROGER E. LEVIEN, DIRECTOR, NATIONAL INSTITUTE OF EDUCATION PLANNING STUDY, THE RAND CORP.

Dr. LEVIEN. Mr. Chairman and members of the subcommittee, my name is Roger E. Levien. I am, as the chairman has said, director of the National Institute of Education planning study conducted by the Rand Corp. under the sponsorship of the Office of Education.

The views and conclusions I will express are mine and those of my study group and should not be interpreted as representing the official opinion or policy of Rand or of the Department of Health, Education, and Welfare.

I am grateful for the opportunity to testify before this distinguished subcommittee on a matter of such potentially great importance for American education as creation of a National Institute of Education.

The preliminary planning study, which I have been leading, began last April at the request of the then Commissioner and Assistant Secretary of Education James Allen. He wanted to have flesh put on the bones of the ideas expressed in the President's message on education reform and the accompanying legislation.

He sought to have a number of technical questions that remained open explored far enough to develop a more comprehensive, coherent picture of what the Institute might become.

My testimony will draw upon the preliminary plan that resulted from that request. But I want to emphasize that this plan should be understood to be but the second stage (after the President's message and the accompanying legislation) in the continuing evolution of the Institute.

These hearings might be considered the third stage and, if the Institute is authorized, there should be additional stages of modification and adaptation as long as the Institute retains the capacity to renew itself as circumstances change.

I hope that this preliminary plan, therefore, will be a useful contribution to the very important deliberations of this subcommittee on what your chairman has termed "a social invention of the higher importance . . . one of the most significant initiatives in American education in recent years."

The planning study began by identifying the questions that needed to be addressed. These fell into five categories:

One, objectives. What should the principal objectives of the NIE be? Two, program. What program activities should the NIE undertake? How should the choice of program activities be made? Three, organization. What should the internal structure and management procedures of the Institute be? Four, relations to other parts of the education system. How should the NIE relate to other Federal, State, local, and private agencies concerned with education? And five, initial activities. What early activities will give the NIE the best chance of success?

Several sources are employed to help answer these questions. The first, and most important, was wide consulation with individuals in education and research. During the initial stages this took the form of individual and group discussions with over 200 persons.

Last fall an advance draft of the preliminary plan was made widely available for comment. Over 150 written replies were received and were used to guide the revision of the draft.

The second source of information was examination of comparable research organizations, such as NIH and NSF, for lessons from their experience that might be applied in planning for NIE.

And the third source was the extensive literature concerned with educational R. & D., science policy, the management of R. & D. enterprises, and Federal science administration.

The preliminary plan provides answers derived from these sources for each of the five categories of question.

Why a National Institute of Education? One question that the planning study did not set out to answer directly was, why create a National Institute of Education?

Our charter was to explore what the NIE might become if the Congress were to authorize its creation. Nevertheless, during that exploration we have become familiar with the reasoning that has led to the call for creation of an NIE. It may be useful to review it here for the subcommittee.

The reasoning begins with the recognition that American education faces severe problems, despite its significant achievements in broadening access to education. All of us are aware of the symptoms of a widespread malaise; children born into economic or social disadvantage suffer educational disadvantage as well, and are doomed to perpetuate the conditions that will capture their children in turn, despite the billions of dollars that have been put into special educational programs.

Even children born into more comfortable circumstances often find education joyless and inappropriate, despite heavy investments in school facilities and equipment.

Financial crises occur with growing frequency at every level of education, despite the rapid growth in support for education over the last few decades.

Learning in all settings is disrupted by acts of violence, despite a variety of efforts to meet the demands of students, faculty, and the public for changes in educational governance.

The problems are severe indeed. But the aspirations are high as well; Americans continue to expect much from their educational system. To alleviate its problems and achieve its aspirations, American education, at all levels and in all forms, must undertake a continuous program of improvement and reform.

The reasoning continues. But not enough is known and what is known is not available enough to bring about improvement and reform at a rate adequate to meet education's needs.

The necessary knowledge may be acquired in two ways, through the random and casual process by which most institutions and individuals learn from experience, trial and error, or as a product of the interrelated and disciplined procedures by which scholars, scientists, and technologists gain information and use it, research and development.

While random and casual processes of learning about education will continue, they are insufficient. Educational R. & D. is necessary to gain the knowledge needed for educational improvement and reform.

What can educational R. & D. provide? Neither miracles nor instant solutions. Its foundations are still weak, as were those of agriculture and health in the last century, and the phenomena with which it must deal are extraordinarily complex and subtle. Their comprehension will demand years, sometimes decades.

Nevertheless, R. & D. in education, like that in industry, health, and agriculture, can serve practice well even when not providing breakthroughs in knowledge or technique. For educational R. & D. should comprise a broad range of activities from fundamental research through product and process development to the implementation of new practice.

While research attempts to unravel the biology, psychology, and chemistry of learning, development can proceed to combine science with art and judicious experimentation to produce new child care programs or widely different forms of education or more effective school management procedures. And implementation can see that new knowl-

edge, procedures, technologies and forms of education enter practice.

Research, development, and implementation, though all essential parts of the process of improving and reforming education, need occur in no fixed order. A research finding may indeed lead to a promising educational development, which in turn requires implementation to enter practice.

But development may also reveal questions that become the challenge to research. And implementation may uncover difficulties or opportunities that suggest further development.

In a vital and effective R. & D. system all these kinds of activity will be underway at the same time in a complex balance and interrelationship. When that balance is absent, research results fall on barren ground and research turns inward and becomes precious or irrelevant; development products make little headway into practice and often relate poorly to the needs of the user, and implementation serves simply to distribute poorly conceived new ideas and to amplify faddism. Educational R. & D. today shows all the symptoms of this lack of balance.

It suffers from other deficiencies as well. Although research on education began in the 1890's, it was not until the mid-1950's that significant national investment became available, and only after 1963 that the OE provided funds passed the $10 million mark.

Even now educational R. & D. receives only slightly over $200 million each year, which is tiny compared to the size of the educational enterprise, $70 billion yearly contribution to GNP, 3 million personnel, 60 million students. R. & D. investment is about 0.3 percent of total educational expenditures.

As several previous witnesses have testified, this is a trivial investment in developing the knowledge for innovation and reform, especially when compared to the investment in such activities made by other national enterprises.

Health invests about $2.5 billion in R. & D. each year; 4.6 percent of total health care expenditures and 12 times as much as education invests.

Agriculture invests about 1 percent of agriculture's contribution to GNP in R. & D., about $1 billion for new knowledge and practices and five times as much as education invests.

Moreover, if education were ranked among the major industries according to R. & D. expenditures it would stand in 13th place, just below the stone, clay, and glass products industry, and far below the $5.6 billion aircraft industry R. & D. program, or the $4.2 billion program of the electrical equipment industry.

Of course, the comparison with health, agriculture, and industry is not sufficient to demonstrate the need for more funds for educational R. & D. Educational R. & D. is not as fortunate as those areas in the solidity of its scientific base, the demand for and acceptance of innovation by its clientele, or the ability to measure and display improvement.

Nevertheless, these comparisons are useful because they show the cost and scale of reasonably successful R. & D. systems in other major enterprises of no greater complexity or challenge than education.

As Secretary Richardson noted in his testimony, since 1950 over $14 billion have been invested in health R. & D. by the Federal Govern-

ment alone, over $7 billion have been invested in agricultural R. & D., but less than $1 billion have been invested in educational R. & D.

Thus, the present inability of the educational R. & D. system to satisfy the needs of education for knowledge to guide improvement and reform becomes understandable. It is very likely too small. But smallness has been exacerbated by other deficiencies.

The reputation of educational R. & D. has been relatively low. It has not occupied the rank in the hierarchy of scientific activities that its importance and challenge warrant, nor has it attracted as many people of as high competence as it needs.

The scientific base has been narrow, psychology has provided most of the basic concepts and techniques.

Its focus has been diffuse. Most of its efforts have been dissipated in small projects asking small questions with small effect.

The linkage between educational R. & D. and the classroom has been weak. Not enough output has found its way into practice, nor have enough classroom problems been solved through R. & D.

Finally, the support for educational R. & D. has been unstable. Rapid changes in staff and priorities in Federal agencies have caused frequent fluctuations of emphasis.

So the reasoning continues, the educational R. & D. system must be strengthened. It needs greater support, higher stature, more high quality personnel from a wide range of disciplines, effort channeled into critically sized activities addressing issues of high scientific or practical consequence, closer linkage with the educational system, and the stable support and leadership essential to the development and maintenance of multiyear programs addressing major questions.

However, the action to overcome these difficulties cannot be taken by the educational R. & D. community alone. Almost 90 percent of educational R. & D. funds are provided by the Federal Government.

How much Federal money is spent, how well, where, and for what, strongly affects the direction and quality of educational R. & D. Thus, it is argued, strengthening educational R. & D. must begin with the strengthening of Federal support and leadership.

Two things are essential, wise management and sufficient funds. But, as a practical matter, neither wise managers nor sufficient resources can be attracted and employed to best effect in the absence of the proper institutional framework.

Thus, the characteristics of the principal Federal agency supporting educational R. & D. are of central importance.

Now we come to the last step in the chain of reasoning. Considering the need, and reviewing the diagnosis of the problems, the conviction developed that to strengthen educational R. & D. would require the support and leadership of a Federal agency with the following characteristics.

One, stature within the Government comparable to that of such R. & D. agencies as the National Institute of Health, National Science Foundation, and National Bureau of Standards. Such a position seems essential if the agency is to achieve leadership among the several Federal agencies that support educational R. & D. and if it is to have a strong voice in support of educational R. & D. within the executive branch and before Congress.

This heightened administrative position and visibility would also be expected to have the effect of raising the stature of educational R. & D. among the public, educators, and the R. & D. community.

Two, active advisory councils, broadly representative of the education and R. & D. communities and the public, to help the agency develop its policies and programs. These councils would be expected to help to assure that the Federal Government's support of educational R. & D. activities reflects the needs and has the support of the educational community. They would also advise on the choice of areas of program focus and help maintain stable support for multiyear programs.

Three, an internal R. & D. activity concerned with illuminating the major issues facing American education and identifying promising directions for educational R. & D. The deliberations of this internal group would help the agency to define appropriate areas in which to focus resources.

The group would also be expected to establish the climate of intellectual challenge and concern for education that would help to draw first-class staff to the agency.

Four, a flexible personnel system, modeled on those in other Federal R. & D. agencies, such as NSF and NIH. The personnel system, it is maintained, should enable the NIE to hire competent staff from many disciplines and backgrounds in competition with universities, industry, and other R. & D. agencies and to provide short-term positions as fellows to those who plan to spend most of their careers in other organizations.

Five, authority, to carry over unexpended funds from one year to the next. The funding authority would permit it to provide stable funding for multiyear R. & D. programs.

The principal Federal agency for Federal support and leadership in educational R. & D. NCERD, as currently constituted, has none of these five characteristics.

Thus, the conviction has developed in recent years that the best way to strengthen Federal support and leadership for educational R. & D. is to supplant NCERD with an agency having these characteristics, the proposed National Institute of Education.

What might the National Institute of Education be like? Now, having reviewed the reasoning, as I understand it, that has led to the call for a National Institute of Education, I would like to present one picture of what the NIE might become if it is authorized by the Congress.

In the interests of brevity, I would like to emphasize the answers to three major categories of questions asked during the planning study, objectives, program, and organization. I would be happy to discuss the other categories in response to your questions.

I will also phrase my description of the NIE in more definite terms than the current stage in development of the NIE may warrant, since obviously what the NIE will become will be determined by the Congress, deliberations within the administration, and the advice and decisions of the NIE's staff, advisory groups, and clientele.

So I hope you will understand my description to refer to the model of the NIE that was developed during the preliminary planning study. With that understanding, let me summarize what such an NIE would be like.

What would the NIE's objectives be? The primary objective of the NIE would be to improve and reform education through research and development. Improvement and reform of three specific kinds would be sought, increased equality of educational opportunity, higher quality of education, and more effective use of educational resources.

Education in all settings, both within schools and outside of them, and all of Americans, before, during, and after the traditional school ages, would be within the NIE's scope of interest. And all kinds of R. & D. activity, from basic research to large field tests and demonstrations, would be in its repertoire.

To attain this primary objective, the NIE would undertake efforts directed toward four specific supporting objectives:

First, to help solve or alleviate the problems and achieve the objectives of American education;

Second, to advance the practice of education as an art, science, and profession;

Third, to strengthen the scientific and technological foundations on which education rests; and

Fourth, to build a vigorous and effective educational research and development system.

What would the NIE's program be? The design of the research program would follow from the NIE's objectives. Associated with each supporting objective would be a major program area of the Institute. Program area I, solution of major educational problems; program area II, advancing educational practice; program area III, strengthening education's foundations; and program area IV, strengthening the research and development system.

These program areas would be divided, in turn, into several program elements. The number and definition of the program elements in an area might change over time as priorities and competencies change. The program elements would comprise, in turn, a cluster of program activities. These would ordinarily be individual projects or groups of closely related projects.

The four program areas would differ in the priority and support assigned to each, in the criteria and methods for program design, and in the range of R. & D. activities involved. They would require different internal organizational structures for their appropriate management.

What would the NIE's organization be? The NIE would be a separate agency within HEW, parallel to the OE, reporting to the Secretary of HEW through the Commissioner of Education, led by a Director at executive level 5.

Its administration would be provided by the National Advisory Council on Educational Research and Development, which would assist in setting general policy, and the Director, who would be responsible for continuous administration of the Institute's policies and programs.

The internal structure of the Institute would correspond to the structure of its programs. It would comprise a Directorate of Programs, headed by an Assistant Director for Programs, responsible for program area I, development and management of comprehensive national programs that address major educational problems; a Directorate of Research and Development, headed by an Assistant Director for Research and Development, responsible for program areas II, III,

and IV: development and support of coherent, cumulative efforts to strengthen educational practice, the foundations of education, and the educational R. & D. system: a Center for Educational Studies, headed by an Assistant Director for Studies, responsible for intramural studies, conduct of a program of studies of the state of education, analyses of educational problems, and design and evaluation of R. & D. programs; and the usual staff functions for administration and communication.

How would the NIE function? The NIE's functioning may be best described in terms of its four major program areas and its intramural program.

The first priority of the NIE would be to organize, support, and carry out comprehensive national programs, combining research, development, experimentation, evaluation, and implementation activities, attacking major educational problems. It would devote a major portion of its resources, on the order of 50 percent, to this program area.

Illumination of the nature of education's crucial problems would be a major function of the NIE; the intramural R. & D. activity would play a central role in this process. However, that illumination has not yet been performed, so an adequate definition of problems warranting national R. & D. efforts does not exist. Thus, the following exemplars of problems to be addressed must be viewed as preliminary and tentative.

Major problems warranting national R. & D. efforts are the poor education received by the disadvantaged, the inadequate quality of the education received even by those from more comfortable backgrounds, and the need to use education's limited resources more effectively.

Certainly these problems would have to be narrowed and sharpened before comprehensive R. & D. programs addressing them could be developed.

To help solve these major educational problems, the NIE would want to do two things. First, bring to bear in a coordinated way all that is already known or developed that might help in resolving the problem; and second, focus careful effort on learning and developing what is needed to provide better solutions.

Central management of each program element would be provided by an NIE program task force, led by a program manager and advised by an advisory panel of educators, R. & D. personnel, and laymen. The staff of the task force would comprise not only permanent problem-oriented R. & D. management personnel but also personnel seconded from those parts of the NIE concerned with support of work on educational practice and foundations.

The latter group would bring to the problem task forces an awareness of the state of the art in their areas of concern, and would take back to those areas an enhanced appreciation of the needs of the educational system.

Program area II, advancing educational practice. The NIE would commit a significant portion of its resources, up to 25 percent, to continuing, cumulative programs intended to advance the practice of education in its artistic, scientific, and professional aspects.

These programs would attempt to do those things that offer the best hope of moving the state of the art forward. The activities would be carried out in many settings, would be less tightly linked together than

the components of a problem-focused program element, and would provide both nearer and farther term returns.

This area would be concerned with the instructional process, content and methods, the educational system, forms of education and their administration, educational assessment, and the education of educational personnel.

Management would reside in a division of educational practice within the directorate of R. & D. Because of the continuing nature of these concerns, each one could be the responsibility of a separate national center, led by a center director, and advised by a center advisory group drawn from those distinguished educators and scholars with a direct interest and competence in the center's area of concern.

The staff could comprise both permanent members and a number of educators or scholars serving temporary tours. To facilitate the exchange of information between problem-oriented and practice-oriented R. & D., center staff members would serve part time on problem task forces.

Program area III, strengthening education's foundations. The NIE would invest a stable proportion of its resources, say 10 to 15 percent, in a portfolio of programs intended to strengthen educational foundations in the sciences and technologies.

Educational practice and the solution of educational problems are rooted in an understanding of the individual as a learner, group processes and how they affect learning, society and its relation to learning, and the technology and media useful in instruction. These would be the central concerns of this area.

Management responsibility would reside in a division of educational foundations within the directorate of R. & D. Each subject of concern would be associated with a program of studies, headed by a program director, and relying heavily on review panels drawn from the scientific community for assistance in program development.

Staff would be both permanent and short term. Many of them would serve part time on problem-oriented task forces.

Program area IV, strengthening the R. & D. system. The NIE would devote a portion of its resources, say 10 to 15 percent, directly to the development of the R. & D. performer community through fellowships, institutional grants, and similar mechanisms.

Among the constituents to which it might want to devote attention are R. & D. manpower, R. & D. institutions, the linkages between R. & D. and practice, and information transfer within the R. & D. system.

Management responsibility for this area would reside in a division of R. & D. resources within the directorate of R. & D. Each constituent would be the responsibility of a program, headed by a program director.

The program professional staff would comprise permanent members primarily. Care must be taken to coordinate these programs with those of other parts of the NIE so that manpower and institutional programs respond to actual needs.

Intramural program, Center of Education Studies. The NIE would devote a small portion of its resources, say 5 percent, to an intramural R. & D. program that would undertake careful study of educational problems, practices, and R. & D. The intramural program would bring together permanent staff and a large number of 6-month to 2-year visi-

tors from the education and R. & D. communities, and others with a deep interest in education.

Management would be provided by a center for education studies. The internal organization of the center would not be so formal as that of the directorates. The basic unit of activity would be the project, each led by a project leader and varying in intensity from one man part time to a dozen or more men full time. An education studies board would advise on the selection of visiting staff and on the program of studies.

Temporary staff would be drawn from other directorates of the NIE; other Federal agencies: fellows, both junior and senior, who come full time for a fixed period; and associate fellows, both junior and senior, who are associated with the center part time for a fixed period.

Major themes of work at the center would include illumination of major educational problems, evaluation of educational policies, and review of the state of educational R. & D.

I have attempted here to provide, in summary, one picture of what the NIE might become. In addition, of course, the Department of Health, Education, and Welfare has made copies of the preliminary planning study available to the subcommittee. I hope that these results of analysis will prove useful to the subcommittee during its consideration of this major social initiative, the National Institute of Education.

I want to very quickly answer, as they are answered in the preliminary plan, three of the major categories of questions that we considered during our study.

Those categories of questions were first, what should the principal objectives of this Institute be? Second, what should the program of activities of the Institute be like, and third, how should it be organized to carry out its program.

I will quickly outline for you our answers, as developed in the preliminary plan, to these major questions. We considered, as well, two other categories of questions, which I hope we can discuss after my formal presentation. They are the relations between the Institute and the remainder of the educational community, and the initial activities of the Institute which might lead to its success should it be authorized.

Let me turn now to a statement of what we felt might be the appropriate objectives for this proposed National Institute of Education. When I say "we" I might elaborate just a bit to say that the study group felt itself to be a mechanism by which the many people with whom we have consulted in the research and development communities could express their attitudes and ideas about the shape and form that the National Institute of Education might take.

So the ideas that I will express today come from discussions with several hundred individuals in those communities, from the reviews of a preliminary draft of the plan that was sent to several hundred more individuals, and many discussions and conversations with others in various communities.

Mr. BRADEMAS. I might here inject that it seems to me that your own preliminary study is of such indispensable importance to our understanding of the President's proposal, I should like to ask unanimous consent to insert the text of your study in the appendix of our hearings as it appears in final form.

Dr. LEVIEN. Thank you.

Now let me turn to objectives. It was the general conclusion of those with whom we spoke that the overarching, primary objective of this Institute must be to improve and reform education through research and development.

The objective is not to build the R. & D. community, but rather to see that research and development can be turned to the reform of American education.

I would like to talk about each of these phrases. First is improvement and reform. The text of the bill as introduced emphasizes two directions in which improvement and reform of American education must be sought.

One is in the equality of educational opportunity and the other is in the quality of education. We think, as well, that the Institute must turn itself to the question of how the American educational system can more effectively use the resources, generous as these have been in the past, and limited as they are at present, that it has available to it.

Second, when we say "education," we mean education in all sectors, not only that education which takes place in the schools, but education which occurs outside, in the home and in libraries and through television and by all of the other means in which the American people become aware of the world around them and the culture that has been transmitted to them.

We mean that the Institute should be working with education after the schol ages; it must be concerned with the preschool as well as the postgraduate, and it must be concerned with elementary and secondary education as well as higher education.

Concern with the problem of American education cannot be confined to one level or another. The Institute must be free to follow the thread of a problem across the educational fabric as that problem demands.

Finally, when we speak of research and development, we mean not the conventional picture of educational research, psychologists working with one or two children, or perhaps white rats, we mean the entire spectrum of R. & D. activity from small laboratory experiments through large school field testing, and experimental schools, the introduction of research findings into practice, and so on.

We conceive of the Institute as concerned with the entire process of generating and deploying new knowledge in education.

That, of course, is a grand and broad and entirely laudable general objective for the Institute, but the real question becomes, how is it to implement this objective, and how is it to reach those goals?

Some of those with whom we discussed this question would have had us focus on basic research in education. Their feeling is that the lack of fundamental understanding is the weakest link in the development chain.

Some have phrased it in the following way: Our understanding of the foundations of education is now similar to the state that our understanding of basic health questions had reached in the 16th century.

So many would concentrate NIE's study efforts on basic research. Others say that we cannot wait until we understand more fully the fundamental problems of education. We must work on the problems we have and do what we can with existing knowledge, and focus on development and problem solving.

Others say we can't do any of these until we have a more effective R. & D. system, more R. & D. personnel, better institutions, and so on.

The conclusion of the study group was that indeed there is sense in each of these points of view, and that the appropriate strategy for the Institute is a mixed strategy, one in which it does each of these things at the same time, in which it seeks to reap a harvest at the same time as it is planting the seeds of future harvests.

So the Institute must, in order to serve its overall objective, satisfy four supporting objectives, first, to help solve or alleviate the major problems that face American education today. It must work on those problems and do what can be done with the existing knowledge to solve them.

But, those problems can be only partly alleviated, because the practice of education, our understanding of the instruction process, of the proper forms of education, of the evaluation of educational achievement, and of teacher education is too poor to enable really significant advances to be made.

So we must satisfy a second objective, to advance the practice of education as an art, a science, and a profession.

But, to do that we must build on the scientific and technological basis of education. So the third objective must be to strengthen those scientific and technical foundations.

Fourth, indeed we cannot do all of these things until we have more R. & D. personnel and better institutions in which they can work, and a closer linkage between the R. & D. system and the school systems.

So the fourth supporting objective must be to build an effective educational R. & D. system.

Each of these objectives implies certain features of the program and the organization of the NIE. Thus, rather than discuss these objectives first, and then program and then organization, I would like to discuss each of them and the associated program and the corresponding part of the NIE's organization.

To set the stage, however, let me just briefly sketch the major structures of the program and the major features of the organization.

The major program features are the following: We have divided the program as proposed in the preliminary plan into four major areas, each corresponding to one of the supporting objectives. So a major part of the NIE's program, perhaps 50 percent, would comprise comprehensive national programs addressing major educational problems of today, the problem of the disadvantaged, disorder in the schools, the problem of inadequate financing for our schools.

The second part of the program, which might take something like a quarter of the effort, would be concerned with advancing educational practice, cumulative efforts to add to our understanding of how to improve instruction, how to measure what we accomplish in the schools, and how to teach teachers better.

A third part, maybe another 10 or 15 percent of the total budget, would be concerned with basic research, the understanding of how individuals learn, how society affects education and vice versa, and how technology can be used more effectively in education.

The fourth part, perhaps another 10 or 15 percent, would be activities addressed to strengthening the R. & D. system, to adding personnel through fellowships and institutions through institutional sup-

port, to developing new means of disseminating and delivering the findings of R. & D. to practice.

Now that is the basic structure of the program. I am sure that by now the basic structure of the organization is familiar to you.

The report agrees that the NIE should be a separate agency within HEW, parallel to and outside of the Office of Education, reporting to the Secretary of HEW through his designee, the Commissioner, and led by a Director, who is at least at executive level five in stature.

We see the important need for a National Advisory Council which can help to assist in setting general policy and for a director of the highest competence who would be responsible for the continuous administration of the Institute's policies and programs.

We see three internal substructures; first, a directorate of programs. This suborganization would be responsible for managing and developing the comprehensive national programs addressing particular problems. It would do this through the agency of a task force and a task force leader, for example one on the disadvantaged, one on disorder in the schools, and one on effective use of educational resources.

Second, a directorate of research and development, which would be responsible for organizing programs to advance educational practice, to strengthen knowledge of the foundations of education, and to build the R. & D. system.

So two directorates of the Institute would be concerned with the support of extramural programs. These would be funding work going on primarily outside of the agency.

The third suborganization is responsible for the intramural activity at the Institute. It would be a Center for Educational Studies, which would be responsible for a program of intramural activities, emphasizing the state of education, analysis of educational problems, and design and evaluation of the R. & D. program.

This we see as a place which would encourage wide ranging consideration of American education, which would have on its staff perhaps no more than half permanent members, but would invite the participation for six months or two years of people from the educational community, and R. & D. community, to come together at single place where they can think and work and interact about our major educational problems.

Perhaps rather than go into even more detail about the way each of the activities would be constructed, it would be more useful for you if I simply said that this is an outline, a sketch of what is contained in the preliminary plan, and I will make myself available to respond to any questions you might have about the Institute.

Mr. BRADEMAS. Thank you very much, Dr. Levien.

I have several questions to put to you. One, I wonder if you could comment about the relationship between the NIE and other educational research that is presently being administered by the Federal Government, (A) in the Office of Education and (B) outside in the National Institutes of Health and the Department of Defense and so on.

Dr. LEVIEN. Yes, I would be happy to. I guess I must start with one statement of philosophy about educational R. & D., which I think will explain why I am going to answer as I will. That philosophy is that educational R. & D., the activities that are included under that broad term, should be a part of all educational activities.

There should be research and development going on in local school districts, State agencies, and every agency that has a concern with education. In order to explain that, I must mention and emphasize that research and development includes such activities as the study of public policy, the evaluation of program alternatives, the development of curriculums, and the design of experimental schools.

So I see first of all that with regard to the Office of Education, those activities of a national scope that are currently being sponsored by the National Center for Educational R. & D. should be transferred to the NIE.

I should say NCERD's authorities, not necessarily it activities, should be transferred to the National Institute of Education. However, I would see it as desirable that educational R. & D. of a certain kind be a part of the activities of each of the bureaus that remain in the Office of Education.

There is, for example, some work already of this kind going on in the field of the handicapped. The kind of work I have in mind is short-term research aimed at particular problems of operation within that bureau or particular policy concerns of that bureau.

I don't believe that all educational R. & D. should be gathered into a single agency, but rather that R. & D. is an intimate part of the process of decisonmaking and should be widely distributed.

Secondly, I think having research and development going on within an agency will encourage a closer interaction between the issues in that agency and the National Institute of Education.

So I see some R. & D. people in the bureaus who will have communication with people in the NIE concerned with similar issues, and who will serve as a means for translating R. & D. findings into practice and for informing the R. & D. community of issues of concern to OE.

I understand that that may sound as though it is encouraging duplication, but let me emphasize that that is not what I am saying. Rather, I am saying that research must be associated with action, that action occurs in education in many places, and that we have appropriate and relevant research going on in those places.

But as I say, most of the current R. & D. sponsored by the Office of Education is in NCERD and that R. & D. authority should go to the NIE.

Mr. Brademas. Just at that point, if you could elaborate just a little further, I can understand taking their activities over but I am not clear on the extent to which you feel that existing operating programs should retain some capacity for research in their programs. I am not clear on the extent to which you contemplate that research should be carried on in any of those activities, in the handicapped or technical education, or libraries or whatever.

This is a matter of some interest to some people who work in this town, aside from the more important subject of how most effectively to spend the funds.

Dr. Levien. I think we would have to look in some detail at the kind of programs currently being supported there, to say how much should be transferred and how much should not. I think those activities that are of immediate relevance to the programs of the Bureau, that is, that will have some impact on what the Bureau does in the next few years, should be handled through the Bureau.

That research which is more basic and long-term, for example, understanding the differences in the appropriate rate of learning of certain kinds of handicapped children, should be the concern of the NIE.

But I think the necessary coordination would be facilitated by having R. & D. people in both places. I would hope that they would interchange and communicate very extensively. Industry has discovered that most dissemination of information occurs not through pieces of paper, but through contacts with people.

One of the failures of the educational R. & D. system has been the clustering together of R. & D. people who cannot communicate with those in educational practice, because they have no common language or common vocabulary.

So I would hope that we would see over the next few years a diffusion of people with a concern for R. & D. throughout the educational community. Those with short-term interests would be in the practice part of the community, and those with more general interests would be in the R. & D. part of the community.

It is from that philosophy that my answers are derived.

I will use that philosophy to respond to your question about R. & D. outside of the Office of Education. It seems to me that there are proper educational R. & D. concerns of, say, the Department of Defense, which runs one of the largest technical training organizations in the world and which has large training programs of all kinds. I think it would be appropriate and desirable that it maintain activities to answer the problems it has in training, which are somewhat different from the more general problems of education. However, I don't think it should get too widely into basic problems of education.

For those concerns it should turn to the national institute. Clearly NIE has a responsibility to know what is going on throughout the Federal agencies, to undertake a wide range of activities to see that these are coordinated and to see that what is found in one place becomes available in other places.

But I don't think it should become the monopoly institution of educational R. & D. R. & D. is too important, and too much a part of educational practice to isolate it in one place.

Mr. BRADEMAS. Following that philosophy, I would suppose you would want to see in the NIE itself not only professional researchers but persons from other disciplines such as cybernetics or anthropology or biomedicine.

Dr. LEVIEN. I think one of the failings of educational R. & D. has been that this subject, of such fundamental importance to mankind, of deep challenge, has been so narrowly construed as a discipline.

I think education and educational questions are a proper concern of economists and sociologists and political scientists, of historians and philosophers and mathematicians and linguists.

Yet for a number of reasons, mainly historical and sociological, these disciplines have not engaged and applied their talents to this challenging set of issues. I hope the NIE will be a mechanism for soliciting and attracting into the study of education the talented people who have much to contribute, but have not yet done so.

Mr. BRADEMAS. I have two other quick questions at this point. One, you said you hoped the NIE, would have an autonomous and independent status outside the Office of Education in HEW, but reporting to the Secretary through the Commissioner of Education.

I can conceive of difficulties in blending the first half of that description with the latter half. I can elaborate on the question but I am sure you have its thrust.

Dr. LEVIEN. I understand the question because for the last 11 months now, one of the issues that has come up most frequently has been—there are two sides of the coin—how will the NIE relate to the Office of Education and how will it be kept from relating to the Office of Education, depending on the point of view of the person we were talking with.

It seems to me that there is a problem of balance here, of institutional design. It would be inappropriate, in my personal opinion, for the NIE to operate as a Federal agency concerned with national questions of education in complete independence from what is going on in the Office of Education.

That would be confusing to the States and localities and it would be confusing to the public, and I think it would be ineffective in effecting change in education.

NIE must affect what is done in the Office of Education, as well as what is done in the State and local districts. The problems that the Office of Education faces must influence what problems the NIE works on. But that term "influence" is the important one.

How does that influence occur? I don't think it can be by a rigid linkage, it has to be by a collegial association. I think the compromise of having the NIE separate from the Office of Education, but reporting through the Commissioner, who will oversee both of them, is a reasonable attempt to balance the mutual interests of both agencies for some independence and some responsiveness.

Mr. BRADEMAS. My last question is on money. The administration is proposing $3 million for the next fiscal year for planning for the NIE and down the road by 1977 something in the order of $400 million.

Could you make a comment, again not as a spokesman of the administration but for yourself, on your own recommendations for that time period, as well as with respect to the period a decade from now.

Dr. LEVIEN. Yes; I think, as the evidence abundantly makes clear, that education R. & D. is vastly underfunded compared to the dimensions of the problem and to the hopes we would have for what it might accomplish.

I would hope that we might reach a point when educational research and development would be receiving at least 1 percent of the expenditures in education, and at the time that that would be true I would imagine education would be spending something like $100 billion a year, so I am talking about reaching a point when we are spending about five times as much as we are now. That is about $1 billion.

The question is, what is the best and most appropriate path from here to there? I think really in order to give you a truly appropriate answer one would have to lay out in some detail the initial year's program for the NIE and subsequent year's programs, plus some rate of growth of personnel.

We haven't done that, but my estimate is that we will be bound in what we can do not by our ambitions for educational R. & D., but by our capacity to carry them out with limited personnel, management capability, and institutions.

Looking at the history of the growth of educational R. & D., one finds some examples where too much money came in too fast, raising expectations and lowering the ability to perform. So I lean to the conservative side, on the basis of that experience, of growth projections in the early years.

I would like to see the NIE laid down on a firm base, with the time to do the kind of homework that has to be done to organize this area, and to build the capacity and attract into the field the competent individuals that are needed.

So my initial projections are low. They are something like $150 million for the first full year of operation.

Mr. BRADEMAS. May I interrupt you. Are you talking about new money?

Dr. LEVIEN. I am talking about total money, but I am allowing for an amount of reprograming. I think that during the first year of operation of the NIE there is going to be a very intense examination of what is going on now, and very careful decisions about what ought to be done in the future.

That is exceptionally hard work, and I would like to see it done thoroughly. Fortunately, some of that is going on now, so part of the effort will have been accomplished.

I would like to see all of that homework done before the NIE gets a large increment of funds, which might be spent less wisely than we would like. So I see a growth of about $150 million in the first year, reaching about $1.1 billion at the end of the decade.

If one looks at the history of the National Institutes of Health from about 1955 to about 1965, that is almost the exact path that was followed. That should give you a feel for the political and scientific problems of accomplishing such growth, because the NIH was dealing with a community of scientists much larger than the NIE can deal with now, with a longer history of accomplishment and, I think, higher competence on the average.

So achieving the growth that I have mentioned, $1 billion in about 10 years, will be a very difficult job and it will require the support of the Congress and of a broad constituency outside of the Congress.

I think the best way to achieve that, and this is a personal opinion, is to start a little bit slowly, but with a very clear plan to develop the competence and capacity for further ambitious growth.

Mr. BRADEMAS. Thank you very much.

I have other questions, but the other members should have an opportunity to be heard.

Unless there is objection, the Chair would like to recognize the distinguished ranking minority member of the full committee, Mr. Quie.

Mr. QUIE. Let me follow up on a few questions that Mr. Brademas asked.

One concerning the relationship with the Secretary of HEW. You mentioned that he reports to the Secretary through the Commissioner.

Why was a better system not established where he would report through the Assistant Secretary of HEW for Education? Why not have the Commissioner report to the Assistant Secretary and the Director of the National Institute also report through the Assistant Secretary? You wouldn't have the same man who directs the Office

of Education also be the person to which the Director of NIE would have to report.

I don't know if there is an Assistant Secretary of HEW for Education. Jim Allen had both jobs and there was nobody put in that place that I heard of.

Dr. LEVIEN. Of course, the President's message was quite clear that the idea originally was for the NIE to report through the Assistant Secretary of Education. My understanding of the situation now is that Commissioner Marland and the Secretary have agreed that there will not be an Assistant Secretary of Education, but that the Commissioner of Education will occupy the position previously occupied by the Assistant Secretary and be the principal Federal educational officer.

In that regard then it is appropriate for the NIE to report to him. Whether the Commissioner should retain the directorship of the Office of Education is another question that might be treated separately.

I think it is important that there be one Federal executive who does retain the responsibility for overall Federal policy in education.

The fact that Assistant Secretary Allen occupied both positions was apppropriate. I think one might imagine a separate director for the Office of Education. That is a separate issue. But I do think the NIE and Office of Education should report to one officer, who could be called the commissioner.

Mr. QUIE. Then under the organization set up, in fact the Deputy Commissioner of Education must be directing the Office of Education, and the Commissioner who serves in the same capacity as if he were an Assistant Secretary for Education.

Dr. LEVIEN. I believe that is right.

Mr. QUIE. Let me ask you also how this program would operate. I understand the various programs and directorates, but these are project-oriented, I imagine, therefore, somebody would send in a proposal for a grant. The way the National Institute of Health is operated, a board of peers evaluates the project application. You are suggesting that there are task forces that would be operating to assist the director to make his decision.

Will these task forces be made up of peers, or will they be people within the National Institute?

Dr. LEVIEN. The Institute structure recognizes something fundamental about research and development, which is that it falls into a number of different categories, which require different management structures.

One category is basic research in which we depend on the university-based scientists in the disciplines to conduct much of the work we do.

The NIH draws heavily on that source and uses peer review. The National Institute of Education will be doing basic research and will rely on similar peer review mechanisms. It will do that under what I call program area III, which is the Foundations of Education.

But the task forces are designed to operate in a different mode, which one might call the NASA or Department of Defense mode, which is not basic research, but rather research and development addressing a particular important national problem. In this area we are not dealing with unsolicited proposals from the scientific community, but we are talking about comprehensive programs, some of which

would be carried out in universities, and some in the regional laboratories and some in industry.

For example, one task force might deal with disadvantaged, and the members would design the program. It would be a nationally led and organized program, just as the effort to launch a vehicle to the moon was.

Then they would contract with a variety of sources to carry out pieces of that program and monitor it and see that it is achieving the goals that have been set forth.

Now, the task force, we imagine, would comprise two kinds of people. One is the permanent members of the staff of the NIE, some of whom would always be working on task forces, but some of whom would come from the research part, and might previously and continuously be funding research on evaluation, or on the foundations of learning.

They would join this task force to bring their knowledge of what is going on in those particular areas to bear on the problem of educating the disadvantaged. They would go back to their long-term work with a better knowledge of the problems of the disadvantaged and the need for further development in their areas.

So the task forces would primarily comprise people from within the NIE, but while some would be permanent task force types, others would be on temporary assignment from other parts of the NIE.

It would also draw on, for short-term assignments, people from the Office of Education, or the National Science Foundation, or the Office of Child Development.

So what I am saying, then, is that the NIE would use several different management mechanisms; peer review where it is appropriate in the basic sciences and technologies, but programs designed and managed directly by the NIE in those areas where we have a national problem that must be addressed in a coordinated way.

Mr. QUIE. That is one of the problems that I can see, when you compare it with the moonshot which was a concerted effort of practically a decade directed by the Federal Government and I can see the similarity to what you are attempting to achieve here for the disadvantaged.

NASA was dealing mostly with the exact sciences and they did not have a great deal of direct impact on people.

Here you are dealing entirely with people, their mental and social development. Won't you have more controversy develop than we did through NASA for the moonshot?

Dr. LEVIEN. Well, NASA no longer is free of that kind of controversy. But certainly the Institute will be dealing with subjects that people feel much more intensely about and that they feel competent to make judgments about on the basis of their own personal experience.

I think it will indeed have to be concerned about the nature of the activities it undertakes, the restraints on its activities, and the advice it draws upon in making it choices.

But I don't think that those need inhibit it.

For example, let us talk about the disadvantaged. What I would hope the NIE would do would be to fund the kinds of activities that people in various communities would like to see going on, and not necessarily choose any single one to be the national approach. It would encourage and facilitate the exploration of a variety of alternatives that people have seen as potentially useful, to make available to those communities a variety of ways of approaching their own problems.

I think as long as the NIE approaches its charter as one of broadening the choice that educational communities can have in solving their problems, and of giving them good information, a lot of the cause of controversy can be avoided.

I am not trying to say that there won't be controversial issues, but those are the important issues in education, and I think the NIE has to be willing to address them.

Mr. QUIE. I am not objecting to the controversy; everybody on a task force seems to be rather permanent. Eventually they may develop a fixed position which may prevent other concepts from being advanced.

When you have decisions made by a board of peers, then the politics of the situation keeps changing, as it does in the National Institutes of Health.

Dr. LEVIEN. That task force would have working with it very closely, I would hope, an advisory group on, let us say, education of the disadvantaged, which would not necessarily be scientific peers, but people from the communities concerned, from the school systems who will have to use this work, and from the general public.

Mr. QUIE. So you will have advisory groups for limited areas?

Dr. LEVIEN. Yes; it seems to me that is essential to do.

Mr. QUIE. That will assure me that there will be outside ideas considered when they make their decisions. Let me ask one other question; when you talk about strengthening educational foundations, let us look at foundations. The National Science Foundation is one that is operating in education. Do you think that there could be a way of developing that type of foundation, one for higher education, and one on vocational education, and so forth, for the various broad categories of education?

Dr. LEVIEN. Let me start with the National Institute of Education, because that is what we are concerned with to the greatest extent. I want to start by saying that I think higher education must be a central concern of the National Institute of Education. Even if it weren't a problem area in its own right, there is much we need to know about higher education when we are concerned with other educational levels.

One cannot examine the problems of elementary or secondary education for long before one realizes that teacher education, what goes on in colleges of education, and liberal arts colleges, is a prime component of both the problem and the solution in elementary and secondary education. So the Institute must have a heavy concern with development and research on questions of higher education. But there comes a point in the R. & D. process when introducing innovations into practice is important, when a new curriculum in teacher education has been identified as being appropriate, when new forms of higher education have been validated. This is now a different kind of task from the conduct of R. & D.

What is essential is the funding task, the facilitation and introduction into practice of new ideas. I can see a role for the Office of Education and perhaps for a foundation in this area—facilitating the widespread introduction into practice of a new idea. There is the need for an agency to give the financial backing that will enable a school to try out and introduce these new ideas.

So that is the role I would see for a national foundation, helping to do that part of the task that has proven so difficult in educational R. & D.: to take a good idea, once it has been developed, and get it widely diffused.

Funds are what are essential at that point. I see the foundation as providing those funds.

Mr. QUIE. As I understand your response you have no objection to the way the foundation would operate but you feel later there may be the necessity of establishing a similar foundation for other areas of education. That is what I understood you to say.

Dr. LEVIEN. Yes; what I think I said is along that line.

I think we need mechanisms for helping to introduce innovations, and the foundation could function that way.

Mr. QUIE. Thank you, Mr. Chairman.

Mr. MEEDS. Thank you, Mr. Chairman.

Mr. Levien, I would like to talk and ask questions about the proposed National Institute of Education, and the proposed executive reorganization plans of the administration, and revenue sharing.

First of all, where in the scheme of things, of the proposed legislative reorganization, would the National Institute of Education fit? Would it be under the Human Resources?

Dr. LEVIEN. I can only speak on my own estimate of the situation.

Mr. MEEDS. I am asking your views.

Dr. LEVIEN. I think it would fit within the Department of Human Resources as specified.

Mr. MEEDS. Now, it is my understanding that there would be in that proposal an office somewhat like the Commissioner of Education, which would be in effect an Under Secretary for Education. Would you feel that the National Institute of Education would be on a parallel with that office and report through it, or under the control of that office?

Dr. LEVIEN. I would see the NIE reporting through it and in a sense under the control of that office. That is it would be part of the cluster of agencies within the Department of Human Resources, reporting through the Commissioner.

Mr. MEEDS. Do you see presently any movement in the Office of Education that indicates they are heading in this direction, that is the direction I have stated, they are making inhouse changes which would easily accommodate or would make the proposals which we have for reorganization, more easily accommodated by the present Office?

It appears to me in other words, that retaining in the Office of Education a heavier research component may fit this concept.

Dr. LEVIEN. I am not privy to the developments in the Office of Education, except in the area of research, and even there less so now than in the past. I don't see anything going on that I would consider inconsistent with that, and I think the Commissioner's testimony the other day indicated that the Foundation, the Institute, and the Office of Education would all report through him to the Secretary.

That looks to me to be a model of what you have just described as the prospect for the Department of Human Resources—a subagency within that Department concerned with education and representing a cluster of activity, one agency concerned with R. & D. and one with higher education, and one with education generally.

Mr. MEEDS. You have visioned the National Institute of Education as carrying on all of the research and development activities of the Office of Education, and most of the activities of other departments and agencies of the Federal Government except those inhouse which are necessary, as you pointed out earlier for the development of their special programs.

Dr. LEVIEN. I see the NIE as the principal agency for widespread support of educational research and development.

Mr. MEEDS. Switching to revenue sharing, let me preface my question with a little background, or what I conceive to be background. It is that one of the responsibilities we are so deficient in is research and development in education, in the field of education particularly. It is the widespread relief in this country that the Federal Government can exercise a lot of control through the development of educational programs.

The result is that some people in some States have been chary of allowing the Federal Government to do a lot in the field of research and development. It would seem to me that with revenue sharing we are going to be passing out more—if it ever passes, and I think it probably won't—but we are going to be passing out more of the funds to the States and scattering our shots so-to-speak, which seems totally inconsistent to me in the field of coordinated research and development. I know that is a very broad question. But revenue sharing strikes me as inimical to the concepts which you have enunciated here this morning.

Dr. LEVIEN. Well, let me say a couple of things in response to that.

First, I don't think the revenue sharing proposals in any event anticipate distributing the R. & D. funds, but rather retain responsibility for allocation of R. & D. funds in the Federal Government.

Mr. MEEDS. Yes; but what if funds which are passed out to States and localities are used for R. & D. at the local level? Under revenue sharing they have a right to do that.

Dr. LEVIEN. The second part of what I would like to say is that I think that would be desirable, providing that there is a large Federal activity in R. & D. that forms the base for effective use of research and development at all levels in education.

As I said earlier I believe in the philosophy that R. & D. must be a part of all educational action and decisionmaking. One of our problems in generating support is that the local and State agencies don't feel that R. & D. is any use to them, and they can't see how it fits into their own plans. They don't have the opportunity for the allocation and purchase of research and development.

I would like to see a situation in which research and development is viewed, as it is in many industries and in agriculture, as a part of the process of conducting a particular activity, so that each local district will have a reasonably big R. & D. program.

If we had only those distributed R. & D. programs, I don't think that they would accumulate. They would be duplicating very heavily. But if there is a strong Federal program that can develop curriculums, and establish the basic institutions, then I think there would be an appropriate environment in which the States and local districts could carry out effective R. & D. For example, they could purchase research from regional laboratories set up by the Federal Government.

I look for a real partnership between the Federal Government and the States.

Mr. MEEDS. Assuming that some kind of coordinating function could be set up, it seems to me useless to have two research and development projects on exactly the same matter going on in two different school districts.

Now, if the National Institute of Education also would serve as a coordinator of these research and development activities that are going on, and then as a disseminator of results when they are achieved, I would agree with you that this is a thing to be desired. But in the absence of that role, and a pretty strong role incidentally in that regard, it would seem to me that what you have just said cannot come to pass.

Dr. LEVIEN. I believe there has to be that strong role. I think that we can look at a particular case in point. These analogies are always imperfect, but the Department of Agriculture does demonstrate a case where the Federal Government and the States work very closely together in an effective way, in which the Federal agencies support basic and background research, and the States work together with the Federal agencies to adapt the findings of that research to local conditions and disseminate it in local areas.

I don't know whether that is the exact model that we want to follow in education, but there are some lessons to be learned from it.

Mr. MEEDS. I have one more question.

You said earlier in your testimony, or in answer to a question of Mr. Brademas, you would like to see $150 million in the first year of operation. What do you conceive to be the first year of operation? Perhaps I missed it in your testimony.

Dr. LEVIEN. It is not in the testimony. I have a section in the report which discusses initial activities, and in that I call for a year of planning starting this June. That is what appears in the budget now as a $3 million item. The first year of full operation would be fiscal year 1973.

During the NIE's planning year the National Center for Educational R. & D. will continue support of R. & D. It will have about $100 million. At the same time the NIE people would be acquiring their staff, and in July of 1972 the transition could occur to complete operation by the NIE.

Mr. MEEDS. We will be charged with writing a bill, and would you suggest a good measure that we could adopt is then taking some percentage of the total educational dollar expenditures in the United States and ultimately reaching what you described as the epitome of 1 percent?

Dr. LEVIEN. I think we should view ourselves, philosophically anyway, as almost a board of directors for the educational enterprise. As such, we have some responsibility for seeing that the enterprise is continually renewed.

Industrial boards of directors invest 4 percent of income, in many cases, on the R. & D. needed for renewal. I think education ought to take a similar point of view. It should invest some percentage of total expenditures in R. & D. What that percentage is is very hard to determine. We would have to consider the demand and the things that are not being done now.

My first estimate is that education ought to aim for an investment of about 1 percent of total expenditures. That will soon be $1 billion, a sizable research and development activity.

Mr. MEEDS. I have heard horseback guesses with regard to aircraft development and that is about 8 or 10 percent for R. & D.

Assuming that is an accurate figure, why is education to be so much less?

Dr. LEVIEN. We are dealing with special circumstances in that case. First we are dealing with an enterprise in which there is a heavy hardware component, a lot of equipment that must be designed and purchased and built. That is exceptionally expensive.

That is not likely to be the situation in education, where most expenses are salary expenses. We are not in a situation of having to replace hardware and, therefore, the kind of research we do has to do with the way people perform, and the relatively inexpensive item they use.

Mr. MEEDS. That may be one of the problems.

Dr. LEVIEN. I will grant you that point. Nevertheless I think we are still a far cry from the situation in the military, where hardware expenses are a large part of the operating budget. I think that we are in a field where the research and development activities are much less expensive. That is not to say they are cheap, but they are less expensive than supersonic airplanes.

Mr. MEEDS. That may be a moot question.

Dr. LEVIEN. Secondly, I think we are in a field that is still young compared to the physical and biological sciences. It is constrained in what it can do. I would hope that in time its activities and results will be so important that we will want to invest more in it. But at the moment I think an appropriate first goal is 1 percent.

Mr. MEEDS. That sounds like a reasonable goal to me, Mr. Chairman.

Mr. BRADEMAS. I am trying to calculate what percentage of the total proposed expenditures on the SST are represented by the proposal to build the two prototypes, which, as I understand it, represent the research and development stage of that. I think it would be more than 1 percent.

Mr. MEEDS. I am sure that it would have been.

Mr. HANSEN. Thanks, Mr. Chairman.

I think I will stay out of that argument.

Let me first of all echo the comments made by our chairman in commending and complimenting you for a very scholarly and comprehensive work. The study that you have put together is really a remarkable document. I am sure it will be of inestimable value, not only to this committee in shaping the legislation, but to those who will have the responsibility for putting together the Institute and implementing it at such time as it is authorized by Congress.

Let me ask, first of all, to what extent the bill that is presently before the committee reflects your conception of the Institute and what it ought to be, and to what extent there is any significant departure from your recommendations?

Dr. LEVIEN. I think the bill as now before the committee is almost exactly what I would like to see. The only differences that I recall have to do with the number of members on the National Advisory Committee and their term of service.

On the basis of an analogy with the National Science Board, I had recommended 24, and a 6-year term of office rather than a 3-year term of service. I think there are strong arguments on each side.

My feeling is that there are so many points of view that are valid and legitimate in education that it would be appropriate to have this principal advisory committee larger in number so that they could be included.

The other point of view of course is that a group of that size may become difficult to use. It may be too large to function effectively.

There is experience on either side, and I think the experience inside Government argued strongly for the 15 number. I don't feel terribly strongly about that.

I personally feel that 24 would be a useful number, but it is not critical to the success of the Institute. I think the 6-year term is important, although it could be achieved under the existing bill by two successive terms.

There will be many issues that are complicated, and that demand high competence and considerable experience of the advisory committee members, and I would like to see them serve long enough to develop that competence.

Mr. HANSEN. Speaking of the advisory committee, I raised a question with respect to this part of the bill in our New York hearing Saturday morning, with two former Commissioners of Education. I might say in both cases they indicated what I interpreted to be a general skepticism about advisory committees, but felt that this is a place where there ought to be an advisory committee, and where one could function with great effect.

I didn't raise the question as to numbers, but when I ask about their conception of how it should be organized and who ought to be on it, my guess is that we would have ended up with numbers closer to your recommendation.

They were extremely helpful in adding some interesting recommendations on the makeup of the advisory committee.

Let me ask you if you would enlarge a little further. You know the bill does not do any more than establish the committee and say what the terms are going to be. It doesn't say very much about who ought to be on it. I think for purposes of legislative history and further guidance it would be very helpful to have your conception of the kinds of people that should serve on this committee.

Dr. LEVIEN. Yes; there are three categories of indivuals I would like to see on the committee. First, representatives from the research and development communities, not necessarily educational research and developmnt. They might be broader in scope.

There may be scientists and even some engineers, and historians and philosophers. to bring their points of view and contacts with their communities into the highest deliberations of the Institute council.

Secondly, I think there must be a representation from the educational communities—superintendents, teachers, commissioners of education, and principals—people who have distinguished themselves by their ability to think beyond their immediate problems, and to be statesmanlike in their examination of educational problems.

And then the third group I would like to see are representatives of the public, public interest more broadly stated. But again these should

be people who have shown an interest specifically in education and demonstrated their facility to think about and to represent important points of view in the community.

So those three groups should be represented. By my estimate there could be eight from each, but five would be about the number from each in the current legislation.

Mr. HANSEN. One of the suggestions I heard Saturday was that there be considered in the makeup of the advisory committee, a representative who comes from another country where there is a good deal of attention being given to educational research and development. How does that strike you?

Dr. LEVIEN. Offhand it sounds rather interesting. I am very much aware and concerned about educational research and development in other countries. There are examples and information we should have available to us of work being done in Sweden, and Japan, and Canada.

I think our communities are still too dispersed, that the communication is not what it should be. I think each of those countries looks to the United States and knows what is going on here, but the reciprocal concern is not as strong as it should be.

I could see other mechanisms that might be even more useful, including having foreign representatives on other working groups of the NIE.

Mr. HANSEN. I have one final question, on the major problems of education, toward which the efforts of the Institute might be directed. This question I might say came up last Friday in the course of our session at the Educational Testing Service in Princeton, where among the major problems confronting education across the country is that of devising the means of adequate financial support, which it seems to me underlies the basic objectives that you identify, increasing educational opportunity and improving the quality of education.

Do you see this as a kind of major undertaking, that the National Institute of Education might usefully address itself to in an attempt to come up with some answers?

Dr. LEVIEN. Absolutely. I would broaden the statement to make it twofold. First, to increase the resources available to education—and when I say resources I mean not only funds but personnel, and facilities, and other things which go into the Educational Act.

But second, I think that there is an increasing responsibility and commitment that education must accept to improve the effectiveness with which it uses the resources available to it.

To serve this goal there are a large number of activities, ranging from better use of the school buildings to employing technology and freeing the teachers from the burdensome tasks that decrease their professional capacity, that could be undertaken.

So I would see the Institute being concerned with both of those questions. I think it will be a priority issue. It must be because of the major concern at all levels of education with these questions.

Mr. HANSEN. Thank you very much. We are most grateful for your help. Thank you, Mr. Chairman.

Mr. MAZZOLI. Thank you, Mr. Chairman.

Doctor, on page 6 of your prepared statement, you mention R. & D. investment in education amounts to 0.3 percent of the total educational expenditures. Is that the Federal budget that you are talking about?

Dr. LEVIEN. That is all investment in education.

Mr. MAZZOLI. State and local?

Dr. LEVIEN. Well, the Federal total, the Federal contribution is about 86 percent of the total.

Mr. MAZZOLI. Throughout the country, at all levels.

Dr. LEVIEN. Yes, in educational R. & D., yes. I say that it is mainly Federal funds, but that includes all of them.

Mr. MAZZOLI. This gets me to the point that does trouble me a little bit in this legislation. That is the fact that some of the school districts are doing pretty exceptional work in R. & D. on their own behalf, and with particular reference to their problems, because some districts have special problems.

I wonder if this work were largely taken over as I think this legislation would probably tend to do, would this be, in your opinion as a professional, and advantageous situation?

Dr. LEVIEN. Absolutely not, and I hope it won't be taken over. I might emphasize that about 95 percent of the budget of the NIE would be expended outside of the Institute. It could be spent in local school districts, and in schools of education, and it could be in the State agencies. I see the NIE as a funding source for these activities, expanding rather than reducing their number and scope.

But secondly, even if it doesn't fund that specific research, I think by strengthening the R. & D. community, and supporting other research, and seeing that those research findings are made available to the local districts, it will facilitate and strengthen the research activities of the local agencies.

I think it would be sadly mistaken to do otherwise. As I have said earlier, what we have to see is research and development as a part of all educational decision making.

Mr. MAZZOLI. You see no conflict between the NIE and local activities in the same area?

Dr. LEVIEN. I would hope not.

Mr. MAZZOLI. You see it as a supplemental help.

Dr. LEVIEN. I see it as facilitating those activities, and providing the environment and support in which they can be carried on.

Mr. MAZZOLI. Do you believe, based on your experience and on the NIH and other activities, that you can have local initiative still expressed, and local approaches to local problems, even through the umbrella of a Federal agency like this?

Dr. LEVIEN. Yes; I think if you look at the way NIH funds are expended, you will see that they go to local teaching hospitals, and universities, and so on. But NIH is somewhat different from what NIE would be.

Mr. MAZZOLI. Let me ask you another question, with respect to the working relationship that you would have with the Office of Education, based again on your experience and the length of time you have spent studying the situation.

Do you envision that there can be a harmonious relationship between NIE, if it is created, and the Office of Education?

Dr. LEVIEN. Yes; I think that there can be. I don't think it is something that will happen automatically. I think it has to be worked on by both sides. One of the reasons that I want to see the Commissioner responsible for both agencies is that it has to be facilitated by the encouragement of people at all levels.

But I would hope individuals from NIE and OE would spend some time working together on task forces and in a variety of other ways, so that they could establish the personal relationships that enable true cooperation to occur.

Mr. MAZZOLI. Maybe this is in the statement, but is Dr. Marland in support of this plan? Is he encouraging its passage with the funding to the extent you have recommended?

Dr. LEVIEN. Yes; Dr. Marland has testified in support of the NIE, the administration's proposal, last week. I wouldn't want to associate him with this particular plan in its detail. As I am sure he sees it, this is one step in the evolution of the NIE, and he has taken the next step of establishing a planning unit which will continue the planning and build on and study other alternatives.

Mr. MAZZOLI. May I ask you just this one question, too.

In this connection, is there anything presently in the OE that is similar to the concept you have developed of the NIE?

Dr. LEVIEN. Some of the existing research and development activity is being reorganized in a direction that makes it a natural precursor. but it doesn't have the stature in its current location in the Office of Education, and it doesn't have some of the personnel and other arrangements that the NIE must have in order to be successful. It is the precursor of the NIE, but not yet what we hope the NIE will be.

Mr. MAZZOLI. You can see them melding together.

Dr. LEVIEN. Yes.

Mr. MAZZOLI. I have one final question, and getting down to the nuts and bolts of taking these proposals home and justifying them to the constituency, some of whom are not much attuned to the idea of spending money on anything in education.

What is the prime justification for setting up an agency such as this is contemplated to be, which is primarily and almost exclusively a research and development operation, when the President and many Members of Congress have talked about a revenue-sharing plan, where x number of dollars is shared or given no strings attached, to local school districts, to do as they please based on what their expertise indicates are the local problems.

To simplify the question, why should we spend it on R. & D. when in a decade $1 billion will be given to local agencies for them to do with as they wish?

Dr. LEVIEN. I think there is only one justification, and that is that it will improve the education of our children and of ourselves.

We have to start with the recognition, which is rather widespread, that American education, despite the amount of money we have put into it, still has failings, recognized both by the public, and the students and by the teachers and principals operating the system.

There is disorder in schools. There is financial crisis. There are disadvantaged children entering the schools leaving with the same disadvantages. These are not problems that can be solved by money alone. We need knowledge to solve them.

American education, like all other enterprises, has to invest a part of its funds in research and development. I am sure all of your constituents are interested in the wise expenditure of whatever funds are available to the schools, which means investing in learning more about and improving education.

What we are not talking about is research for research for research's sake, we are talking about improvement for improvement's sake.

Mr. MAZZOLI.. Thank you.

Mr. REID. I am sorry I could not be here sooner. I have studied to some degree your report on the National Institute of Education, and the proposed plan for the Institute, and your testimony.

Let me ask you a broad question with a slight preamble. In your Rand report, some of the problems you list are uninteresting and inappropriate education, insufficient attention to the needs of clientele, disorder in the schools, inadequate financial support, ineffective use of resources, and difficulty of assessing results, and difficulty of achieving programs.

In your testimony this morning you talk about the R. & D. system, and you talk about the reputation being low, and focus confused and so on. You have also testified this morning about the structure of NIE and the concept. If I were asking you to spread your wings a bit, and talk about what you consider some of the totally new approaches that might be applied, to try to get to the bottom of some of the problems why education is not working, with regard to compensatory education or children from single parents or whether you talk about totally inadequate preschool services which may stunt the growth by 50 percent, nutrition and so on, what are some of the suggestions you would make, the subjects of research, to get to the bottom of some of these problems and make our system work more effectively?

Dr. LEVIEN. Let us take one of the broader areas, perhaps a little too broad for a full program to be designed for it, but I think it could be useful for the purpose of discussion, the problem of the disadvantaged.

The first thing the NIE would do is design a coordinated national program addressing that particular problem. You mentioned a few hypotheses about what causes educational disadvantage, in particular, the influence of nutrition and early child care.

I would see this comprehensive national program doing a number of things.

First, taking those hypotheses and putting them on firm ground, doing whatever research has to be done to determine whether they are true or how they have to be modified.

Second, turning what is known now, or what is well understood into operating programs. The first example is nutritional deficiency. The NIE might support development of some new forms of child care that have a special concern for nutrition and encouraging mental growth in the early years, and so on.

Third, disseminating these results, and making them available through demonstration facilities in various localities.

Fourth, undertaking new developments in entirely different curricula, experimental schools, and forms of schooling, addressed to the problem of the disadvantaged and interlinked to provide a coordinated approach in which research and development and implementation, all focus on this one problem.

The NIE would seek to employ the best people and the best institutions to carry on these programs.

Mr. REID. Let me take one premise, to see whether you tend to agree with it or not. I think there is some evidence that a child learns as

much between 11 months and 4 years as he does between 4 and 13.

If this is true or in general true, it seems to me that we are precluding a major area of growth, particularly when they come from disadvantaged families, for reasons of health or nutrition or just the kind of environment where they never see a book, for example, let alone "Sesame Street" or whatever else they might normally be able to watch. If that is true, aren't we going to have to make a very major effort here within that age group?

Otherwise, no matter what kind of compensatory education you perhaps apply later on or make available, that child is starting away behind.

Westinghouse reports it is going to be very difficult. If it starts late, you are always running against the clock.

Dr. LEVIEN. I certainly agree with the need. But what do we do to get the proper programs into operation? How do we get to those children? What kinds of stimulation do they need? What are the various program models, and how much do they cost? What would they cost for training teachers, and for toys, and for television programs or for whatever techniques are necessary to take that understanding and make it available and demonstrate it? Those are the questions that I would see the NIE working on.

Mr. REID. Let me ask a question on another problem, which is institutional rigidity.

We have seen it in New York City and parts of New York. There has been a tendency, I think, to freeze certain approaches in concrete, to follow only certain approaches to accreditation of teachers, and to become wedded to certain curriculums, to think that you can't jump two or three grades if that is desirable, and there are a lot of institutional blocks.

I have great admiration for teachers in the several unions, but you think that they get more interested in union affairs than they do teaching, and what is necessary to get a teacher in a certain area.

How do you see approaching this problem so that the structure itself will admit of change that research might suggest?

Dr. LEVIEN. I don't think there is any single answer, but I would like to talk about the teacher, who I think we must admit is the crucial part of this. Any reform will be wasted unless it changes the behavior of the classroom teacher.

I think the NIE is going to have to start with in-service training for teachers, and participate actively in the reform of that process, reform in such a way as to engage the teachers from the very beginning in understanding the role and use of R. & D.

For example, if you are a medical student now, you are trained in a teaching hospital where you see research going on, and where it is a part of the actual process of delivering care. If you are a student teacher now, research is something separate that comes to you in little pieces in textbooks.

I think the process has to be built into the teachers' training.

Secondly, it has to be built into the teacher's career. Here I think the schools council model in England is useful. I hope the committee will have a chance to explore it. There they have developed a system of teacher centers in many of the local districts. These are the mechanisms by which teachers in that area come together to work on com-

mon problems and to cooperate with national curriculum development teams. They come to the centers to develop and test improved methods and curricula.

I think many teachers in the United States would respond to that kind of involvement in the process of improvement. What they won't respond to is somebody coming from the outside and telling them what to do without demonstrating why it should be done or how it should be done or involving them in the planning.

In this long answer to your question I have tried to emphasize that I think we have to focus on the teacher and focus on training teachers to engage in the process of reform.

Mr. REID. How would you tackle the problem that could be broadly described as the irrelevance at times of the curriculum to motivate the student or to focus on what they might want to do with their lives.

In the early days, for example, there were no black children in the textbooks and so on.

Dr. LEVIEN. I would see the NIE very actively interested in the development of curriculums.

Mr. REID. The environment might be a good case where you could roll a lot of things together.

Dr. LEVIEN. I think the NIE also ought to be concerned with forms of education. Most of us are forced to accept a specific form of education, we are forced into a certain mold, in which going to college is the next step, or going to graduate school is the next step, when what we really might want is education for a career, or for a different kind of profession entirely.

So I think we have to broaden the range of opportunities, the forms of schooling available to individuals, so that they can sort themselves into the educational form that is relevant to their needs.

There can also be educational alternatives after school. We have limited ourselves too much to the view that schooling is something that occurs between the age of 6 and 21. We have to understand that education is something that goes on throughout our lives. We sometimes should not go directly to college, but take our higher education or graduate education in pieces throughout our career as we develop the need and understand its relevance to us.

Again these are aspects of educational change that I think the NIE should be involved in.

Mr. REID. Thank you very much.

Mr. BRADEMAS. Dr. Levien, I have a couple of other questions I wanted to ask you about.

Can you give me any comment—and if for some reason there is a problem of propriety I can understand—about the activities and operations of the working group which I understand is now engaged in the Office of Education, building on the NIE study you have produced.

Dr. LEVIEN. One of the recommendations in our study is that a next step be taken, which is to elaborate and expand on the kinds of program that the NIE might undertake in its first year.

My plan, for a number of reasons, is rather general about what should be done. It doesn't make judgments of value or selections among program alternatives. I didn't think it would be appropriate for an outsider to make such choices. But to make decisions about budget and staffing and about initial program, there is need for an intensive activity carried on in an environment in which decisions can be made.

I think the intent of this internal planning unit is to carry out that task. I intend to be available and to work with them on a continuing basis as they see fit. I think establishment of the unit is an appropriate step.

Mr. BRADEMAS. I was interested in your colloquy with Mr. Reid concerning the involvement of teachers in Britain. We invite you to make any further general comment you might care to make on the question of linkage between the activities supported by the NIE on the one hand, and consumers on the other.

I suppose that raises the whole question of dissemination, and demonstration, and all of the rest.

Dr. LEVIEN. In the preliminary plan I have used the word "linkage," because I object to the common image of relating R. & D. to practice in which some product is imagined to proceed smoothly from research and development into practice, as though it were on a one-way street. Indeed, if the transfer into practice is to occur, we need a much wider two-way highway, in which the problems of practice are fed back into research and development at the same time as what R. & D. finds is fed forward into practice.

I want to point out that the products of research and development are a vast and heterogenous grouping. There is new knowledge, which might be disseminated through scientific publications, and new curriculums which might be disseminated by textbook salesmen, and there are new technologies which might be disseminated by, for instance, establishing regional computer centers.

There are new forms of teacher education which might be disseminated by having schools of education revise their format and structure.

There are many different products that would come from research and development, and there is no single, monolithic system that I could conceive of which would take all those different products of R. & D. and see them into practice.

At the same time that I say this, I want to point out that the R. & D. production network is still small. And we don't yet have an effective system for getting the linkage between practice and R. & D. to occur.

I have mentioned a number of things that ought to be done, not the least of which would be to see that R. & D. people are present in all parts of the educational system.

Second, I think we have to look at the question of incentives to innovate within local school districts. What rewards are there, and what demands are there for innovation. We have to look at the methods by which teachers are encouraged to engage in the innovative process.

We have to see what rewards we have for commercial activities in innovation, and how we can strengthen the regional laboratories ties to the schools. There are many, many things that must be done to strengthen the linkages. I think the NIE has a major and important part to play in building them in studying them, and in innovating in the establishment of those linkages. Very probably this is the NIE's most important problem.

Mr. BRADEMAS. I appreciate that response, and I must say that I share your judgment that the work of NIE ought not to be regarded as a one-way street, with the image of a man in a whitecoat off in the laboratory doing basic research and funneling it out to the demonstrators out in the field who will test and then decide whether it ought

to be sent back to the drawing boards or funneled out into the system. Rather there should be a more dynamic give and take situation.

Having said that, I would like to invite your comment on something to which you have already addressed yourself. I refer to the relationship between the proposed foundation for higher education and the NIE. I fear that the foundation may represent the establishment of too sharply delineated a distinction between research and development, on the one hand, and the experimental from and demonstration, on the other, thereby pouring more oil on the fire of apprehension that many of us in Congress already have with respect to educational research, namely, that it is too cutoff from its implementation in the system of education. That is one point, if I have made it clear.

Second, when a particular activity within the spectrum of education—in this case, where education—is singled out for very substantial support, indicating, since we talk with money in this town, this signals that it is less important to engage in analagous activities in elementary and secondary education, or in child development or in other very important learning situations.

Then third, there is a bureaucratic problem of the proliferation of structures. For example, we now have the Bureau of Higher Education operating in the Office of Education, and we hope to have some kind of higher education activity going on within the NIE, doing research and demonstrations and experimentation. Then it is proposed that we have a foundation which engages in activities which are still not clearly distinct at least in my own mind, from those that might be carried out under the NIE.

If you were to press this picture, you could well see in addition to that troika with respect to higher education, another troika for child development, another for ESEA, another for libraries, and another troika for vocational and technical education, so that you could have foundations proliferating all over the place. If, therefore, one agreed that the foundation for higher education makes sense, this development would seem to be perfectly rational.

But, I question whether the Foundation for Higher Education, as explained to us, is sensible to begin with. I am not now addressing myself to the tactical problem, namely, that somebody thought this idea up and is now trying to devise justification for it, but rather to the philosophical problems it poses. Have I given you enough to attack?

Dr. LEVIEN. I did address this little a bit earlier, and I don't want to be repetitious, but let me emphasize the first point—the NIE must be concerned with higher education. Nevertheless, I do see a need for another agency, which we might discuss a little bit more.

I can see, for example, the National Institute working in the area of using computers for instruction in higher education, in which it might sponsor work such as is going on at the PLATO project at the University of Illinois, up to the point where curricula have been developed and the system is worked out so that it operates well and it seems to be a valuable and effective tool for instruction.

At that point there arises a considerable funding problem. We are past the prototype stage and we are in production. A lot of universities and colleges will not have enough capital to get this proven technique into initial operation.

In the long run, of course, they should be expected to support it out of their operating funds. But there is an initial phase of encouraging the introduction into practice of what seems to be a valid procedure.

Mr. BRADEMAS. Why can't that be done with the network of required educational laboratories?

Dr. LEVIEN. I see now a role for a funding agency, but it has to be a discretionary funding agency, and that may be the difference between the networks for knowledge and a foundation in my understanding.

Mr. BRADEMAS. What is the difference between that and the present pattern of administration of the higher education programs? There certainly is discretion there with respect to the expenditure of those moneys, and in some cases the money hasn't been appropriated.

What I am trying to understand is the rational justification for creating another bureaucracy, to do, if I understand the law, what is possible under present law?

Dr. LEVIEN. As I say, I don't consider myself expert on the national foundation, nor do I wish to become engaged in trying to support it. I say that from the vantage point of the NIE there is a need for institutions, in all levels of education, to take the innovations and to provide educational organizations with money to help induce them to introduce the innovation into practice, and to some extent to provide technical aid to facilitate the introduction. I think one of the justifications for the foundation form is simply that that is a mode of operation that higher educational institutions find comfortable.

I am not making that argument.

Mr. BRADEMAS. I hope you are not, because the whole point of the Newman report, which the administration has been trumpeting as a first-class report, is to get them out of old ways.

Dr. LEVIEN. Whether it will turn out to be a mechanism for reform will depend on who is on the foundation board, and how they go about giving their grants-in-aid. One has to compare that with the procedures in the Office of Education, and decide which one will encourage what we would like to see.

I come back to saying that there is a point at which the NIE has to bow out, and say to another institution that getting this into practice is your job. The form that other institution should take is an issue I can't address too well.

Mr. BELL. Thank you, Mr. Chairman. It is a pleasure to have you before the committee.

I was wondering if the NIE in its research would be concerned with such things as the timing of high school.

In England they have an equivalent of a high school of 5 years. They have 1 year of college before they graduate. What I am getting at is, would the NIE study the particular problems related to this, as to whether our educational system is going in the right direction?

Dr. LEVIEN. Yes; the National Institute of Education, I am sure, would be concerned with the forms and structure and appropriate timing of education. We can look at the experiences in other countries, in a much more intense way than has been done, and identify what have been the results of the English and other models.

I think there are going to be increasing opportunities in American education for experimentation in form and structure and timing. I

think the NIE would be involved directly in both the funding of such experiments and in their evaluation.

Mr. BELL. Such programs would take time to study, and once that concept is handed down I imagine there would be quite a revolution going on and it will take time before that is felt.

Dr. LEVIEN. Yes; I think that by its nature, educational research and development, like much other research and development, takes time. But, I expect that there will be products that the NIE can show in the short run as well as in the longer run. However, we have not yet invested adequately enough in those long-term commitments. I expect the NIE will do some more of that than has been done.

Mr. BELL. You mentioned textbook sellers—those people who sell the textbooks to the particular schools. It seems to me in some areas, the textbook sellers are really dictating curriculum. By that I mean there are some schools that have no program or system, and whichever textbooks they select will turn out to be the way they are going to teach the children.

Dr. LEVIEN. I mentioned the textbook salesmen as one among many ways of disseminating new materials. It is true that there are deficiencies in the textbook system now, particularly because there are States like California and Texas which have statewide adoption of texts and therefore tend to exert a strong influence on textbook content.

Mr. BELL. The textbooks are produced by private businesses, and the different school boards, I assume, just say this is the textbook we are going to use. Sometimes as I understand it, the textbook producer is unable to get out the right number of textbooks and so sends out the one he wants, without any real checking with the school organization.

Dr. LEVIEN. There are two things that NIE could do in regard to this.

First, it can support development of a wider range of alternatives. For example, education R. & D. in the past has developed a number of improved curriculums in the various subjects, with better materials and wider range of options for the local districts. I think that is one thing the NIE should continue to do. It still requires the textbook distributors to serve as a means of getting the new curriculums out to the schools.

Second, the NIE can support evaluation of these texts and make information available to the local districts on how successful they have proven to be elsewhere.

Mr. BELL. What is to prevent the local school boards and the local State organizations from just thumbing their nose at the NIE and proceeding to follow the textbook producers?

Dr. LEVIEN. Absolutely nothing, I hope. They still have their ultimate authority. But I have faith that good information will be followed, if the information gets to them.

Mr. BELL. Do you visualize the NIE becoming of greater importance as it develops its research and in the influence on States and schools? I mean being an influence because of the fact that there is going to be more money put in, and there will be a greater influence at the local level, if the OE would disseminate the programs that are already ongoing. But would cause NIE more dependence by the local

level than the OE, because they are going to be doing the research that might contain the policy of the schools at the various levels?

Dr. LEVIEN. I don't think it will be quite that way. It is hard to anticipate what the influence will be, but I would expect first of all that the NIE's influence will not be more visible. What you will see is new materials coming out of the University of Illinois or UCLA. They will be supported by the NIE, but they won't have the NIE's name all over them.

The NIE's support will give more options to the local districts, and more curriculums, and better ways of making decisions. Yet the person-to-person advice, and the personal relationships will still tend to flow along the lines that they have to the OE.

I think the picture that Commissioner Marland painted is a feasible one, in that technical advice is given by the OE, and a pool of new curriculums and information is made available by the NIE.

Mr. BELL. You do believe, do you not, that that Commissioner would be in a position to judge the importance of the NIE right alongside judging the importance and the concentration of effort in the OE. You think that he can handle both, and not become blinded by the preponderance of weight from one side or the other?

Dr. LEVIEN. I think he certainly will have a major role to play there, but I think it is true as well that the Congress, through its constituents, will know how well he is serving education, as will the Office of Management and Budget.

Mr. BELL. You are recommending a very strong oversight on the part of the committee.

Dr. LEVIEN. I am certain that there will be strong oversight, and I think it is important for this development in education that it receive the informed and intelligent oversight of Congress. I think R. & D.'s potential for improving education is still not widely understood. It needs the concern and guidance and continuing evaluation of the Congress.

Mr. BELL. I very much agree with you on this. I just wanted to hear you say it for the record. I think an adequate Commissioner of Education will see the importance of that and will balance one against the other. He must visualize himself, and I am sure he will, as a head of really two organizations there.

Dr. LEVIEN. Yes.

Mr. BRADEMAS. I have just two other quick questions to put to you.

One goes back to what we were talking about earlier, on this foundation idea. Agreeing with you that it is important that some agency of the Government be a funding agency for innovative programs, I agree with you too, that higher education certainly requires reform.

Is it not also true that so, too, does elementary and secondary education, and certainly vocational-technical education, and a variety of other activities? Would it not therefore make rational sense to have, if one wanted to establish another structure beyond an existing Office of Education, an agency called a National Foundation for Education, period?

That is to say why not a foundation whose mission would be to fund innovative, reform-oriented programs at every level? At least that makes some sense to me once one comes to the conclusion that you need another structure, apart from the existing program agencies in

One of the things we have to learn is that it is an effective use of the medium itself that must be the principal concern.

I think the NIE might sponsor the development of curriculum materials for early childhood education or physics in higher education, or for geography, or elementary science, that is specifically directed toward the effective utilization of new educational technologies.

For example, the NIE might develop a course that heavily uses the computer and television to convey a subject such as physics to students. It might employ physicists in the universities and elsewhere in the course development, as well as specialists in the medium, and then test whatever the result demonstrates that the technology is an effective tool of instruction.

Here the emphasis of the NIE would not be on the technology itself, but on funding the development of materials that utilize the technology effectively.

Third, it has to be concerned with the institutional mechanisms by which technology is employed. It has to see that the right incentives to produce and utilize technology-teach materials exist, and the right institutions, may be modeled on Children's Television Workshop, develop to bring together skilled people to employ technology to its highest.

We may need more institutions concerned with these things. Again I think the NIE would be experimenting to find ways to make the most effective use of technology for education.

Mr. BRADEMAS. Dr. Levien, we thank you very much, both for your excellent testimony this morning, and for the outstanding study that you have made of the NIE. I hope you will allow us to call on you from time to time as the subcommittee considers this project.

Dr. LEVIEN. Thank you very much.

Mr. BRADEMAS. We are adjourned.

(Whereupon, at 12:10 p.m., the Select Subcommittee on Education of the Committee on Education and Labor adjourned subject to call of the Chair.)

TO ESTABLISH A NATIONAL INSTITUTE OF EDUCATION

TUESDAY, MAY 11, 1971

HOUSE OF REPRESENTATIVES,
SELECT SUBCOMMITTEE ON EDUCATION OF THE
COMMITTEE ON EDUCATION AND LABOR,
Washington, D.C.

The Select Subcommittee on Education met, pursuant to notice, at 10 a.m., in room 2261, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representative John Brademas.

Staff members present: Jack G. Duncan, counsel; David Lloyd-Jones, subcommittee staff; Martin LaVor, minority legislative associate; and Gladys Walker, clerk.

Mr. BRADEMAS. The subcommittee will be in order.

The Select Education Subcommittee is meeting today for the purpose of continuing hearings on H.R. 3606 and related bills to create a National Institute of Education.

Members of the subcommittee have recently returned from Europe where we visited a number of institutions committed to the application of disciplined intellectual work to the task of renewal in education. In each country we visited—in France, in Norway, and in Britain—we found appreciation for the work being done in educational research in the United States. Yet, in each country, there was also a determined effort to apply research findings to problems of education through an organizational form appropriate to this purpose.

The National Institute of Education is conceived as just such an organization, a visible national center with the scientific—and political in the nonpartisan sense of that word—stature to lead in educational innovation.

What is to be the shape of the proposed NIE, and what are to be its priorities? These are difficult questions, and to confront those questions we have heard a number of witnesses. Today, as we continue this process, we are pleased to have with us two persons well qualified to give us the benefit of their own counsel and judgment—Dr. Hendrick Gideonse and Mr. Kenneth Komoski.

Dr. Gideonse—his doctorate is in the history and philosophy of education—headed the program planning and evaluation unit of the National Center for Research and Development of the Office of Education during the years of greatest creativity and innovation there. Mr. Komoski, similarly, has been heavily involved in issues of evaluation. Formerly a codirector of the Institute of Educational Technology at Columbia University, in 1967 Mr. Komoski founded the Educational Products Information Exchange or EPIE Institute. A sort of consumers union for educators, the EPIE Institute tries to help schools evaluate the materials and procedures they use.

Educational research is different in character from research in the physical, natural, or biological sciences. That difference is its inseparable connection to questions of human choice and value. This is true, not only in terms of the outcome of the research as in other sciencies, too, but also in the conception and actual conduct of the research itself.

There are several dimensions to this circumstance. Researchers talk, for example, about the effects the experimenter or experimentation itself—the Hawthorne effect—have on the outcomes of R&D. Philosophers of science point out that in the behavorial and social sciences, researchers are inside the systems being studied, rather than outside of them. The objectivity of the research is impossible to achieve in anything like the way it can be achieved in bio-medical or physical science. Finally, the very act of studying or being studied frequently alters the situation being studied, a circumstance that is particularly true in the case of experimentation involving large numbers of people and considerable investments of public money.

Let me illustrate. Fundamental research studies on the role of reinforcement in human learning are criticized because M&M chocolates are used as rewards. Critics don't argue the research is flawed; quite to the contrary, they're more apt to praise the tightness of the design. What they are concerned about is that using candy as reinforcement encourages the development of immediate gratification motivations when longer term ones are deemed more desirable. Or again, one Bureau of the Budget examiner caustically criticized Sesame Street because it was encouraging children to watch television. "Everyone knows how terrible television is," he said. "Kids already spend too much time in front of the tube anyway. I don't even have a set in my house!" Even the Administration's proposal for the Institute, as Mr. Badillo's question to Professor Moynihan implied, has been viewed as evidence that the President is making only a cosmetic offering for education in place of the real funding advances which various proponents claim the educational system requires.

There are other examples. Certain kinds of learning, research—for example, in the affective domain of emotion, feeling, and so on—are extremely sensitive areas, not simply because of fears for the invasion of privacy of the subjects involved but because of political concerns about the propriety of these matters as proper areas for disciplined inquiry.

Even a subject as obvious and some might say mundane as reading is not immune from sharp debate. Should we do research on the mechanics of the reading process and build materials and techniques based on what we learn, or should we do research on motivation and environments for learning and work in this way to develop the skill of reading? Proponents of one view are charged with being mechanomorphic, with treating children like machines; their opponents are accused of soft-mindedness and opposition to the development of useful knowledge about the dynamics of reading as a complex, psychomotor process.

Continuing with examples, proponents of materials development are accused of being antiteacher. Proponents of improving teacher-based techniques are accused of sidling up to the professional groups. Proponents of basic research are accused of ignoring today's children. Proponents of development are charged with moving too hastily without waiting for an adequate knowledge base. Behavorial psychologists, social psychologists, and humanistic psychologists debate the best, most accurate, or most desirable models of human learning.

If there are any lingering doubts about the political nature of large-scale experimentation one has only to examine the record of the hearings before Senator Nelson's subcommittee focusing on the voucher system experiments being sponsored by OEO.

All these examples illustrate this central, unique feature of educational R&D as mission-oriented behavioral and social science research. It is always and inherently susceptible to moral and political judgment. This is true at conception, when it is being performed, when its results are confirmed, and when their application is being proposed.

This inseparable linkage to values means that educational research is as much a political activity in the generic, nonpartisan sense of the term, as it is a scientific one. This political dimension has vital implications for the design of the Institute, the way in which it goes about its business—in particular, how it relates to the public and the institutions it is designed to serve—and, finally, what business it goes about. I will return in a moment to offer some explicit suggestions.

DELIVERY SYSTEM: AN OBVIOUS SOLUTION TO A MISPERCEIVED PROBLEM

The testimony you have heard so far on delivery systems from the Secretary, the Commissioner, and Drs. Levien and Gallagher has defined the situation incorrectly. The language used mistakenly (and in fairness, I believe, unintentionally) implies that educational change is akin to a physical process where things are delivered from a place where they are to a place where they are not. The last half dozen years of experience convinces me that by itself and without substantial qualification, the press for a delivery system is probably counterproductive.

The trouble with the concept of delivery system by itself is that it implies a one way flow—maybe it shouldn't, but it does—and insofar as that is the impression conveyed, a delivery system solution will fail. The concept suggests a status hierarchy in which research and development personnel have—or are presumed to have—more say as to what kind of innovations should be sought and "delivered." In response to this, educators will tend to resist the low status implications of being on the receiving end of the system; academics and scientists in turn will tend to find confirmed their latent suspicions concerning the professional motives and competencies of the "natives they have come to save."

Let's examine for a moment why responsible innovation is so difficult in education. One reason is the way in which schools and school systems are organized. No efficient means are provided by which new techniques can be judged appropriate and acquired by practitioners. Equally important, standards and techniques for evaluating the comparative effectiveness of innovations do not exist. Furthermore, we get back to the idea that everything in education is intertwined in questions of value. Do we desire *that* particular curriculum in schools? Who is "we" anyway? What ends do we want for our children? What ends do they want for themselves? How do we feel about rewarding kids with radios for academic achievement?

The moral is that there are so many of us, and such a plurality of conflicting needs and goals that it is difficult to identify which ones to serve and how. The result is that there are lots of pressures working for stability and against reform. The present known shortcomings are preferred to the feared or imagined dangers of the new and unknown.

In addition, education is a decentralized responsibility in this country. Many, many people are necessarily involved in decisions to change. Any one of the many is a potential veto point.

Like the research and development which could come to guide it therefore change in education is much more closely related to changes in political attitudes and social values than it is, say, to the availability of the transistor radio, seat belts, or penicillin. In these latter cases, the needs and desires are already recognized by clients and consumers, the manner in which the devices are to be used clearly understood by the clients or easily communicable, and the mechanisms for gaining access to the innovations totally familiar to the client and easily usable.

If I call upon you to be skeptical of the delivery system idea, especially when it appears to have such a compelling surface validity or obviousness to it, what do I recommend in its stead?

Having watched closely and for a long time our attempts at improving education through science, it seems to me that the real need is not a delivery system but rather the creation of a consumer system, an effective market, if you will, for educational research and development.

I think they impose three requirements. The first is the need to insure that the Institute's organization fully reflects the political dimension of educational R&D as well as its scientific dimension. The second is the need to create a consumer system so that delivery systems become desirable and vital. The third is the need to provide for considerable decentralization of both the decision-making and the conduct of educational R&D.

What do I mean by the organization of the Institute? I mean how advisory personnel and panels are utilized. I mean how the Institute relates to State and local educational agencies and the educational programs administered by the Federal government. (In this sense the relationship of the Institute to the Office of Education is just a special case of a larger problem.) I mean how the goals and objectives of the Institute are opened to political—and public—decision-making processes.

Of these the most crucial issue is how the decision-making processes of the Institute can be more widely opened to the public. At present there are no effective counter-balances to the vicissitudes of decision-making within the Executive Branch or within the science community. I have demonstrated the value-laden nature of educational research and drawn the obvious political implications. And yet the present situation within the Executive Branch and between it and the Congress, which the Institute proposal as presently constituted in H.R. 3606 does not alter, allows individuals, oftentimes at quite junior staff positions, to exercise inordinate, essentially private, and certainly nonpublic power in the allocation of research resources.

The examiners appointed, for example, by the Organization for Economic Cooperation and Development (OECD) to conduct the recent policy review of educational research in the United States—much to the dismay of staff personnel in HEW, the Office of Science and Technology, and particularly the Bureau of the Budget—identified this problem as one of the crucial ones confronting American research policy makers. In the examiners' judgment, the existing arrangements for decision-making on research policy and objectives had the debilitating effect of placing people like the Associate Commissioner of Research and the Commissioner of Education in a position without effective authority to match the responsibilities they appeared to be assigned by virtue of their positions in government. From a management point of view this has proved intolerable; for the health of sound policy for educational research it must be corrected.

There are several ways in which such corrections might be accomplished, in which decision-making in the Institute can be attuned more responsibly to political requirements in the generic sense that I am talking about. The most important is through the exercise of regular legislative oversight. The Institute, its programs, its policies, and its objectives must be brought back regularly before the appropriate substantive committees of the Congress. This will not be popular among the scientists, academicians, and the administrators downtown, but it must be done.

Another technique is the development of a coordinated and effective advisory structure for the Institute which assures meaningful access for different and competing constituency groups in education. A third way of assuring that the pluralistic requirements of research and development have an integral political dimension is by allocating significant portions of Institute resources to institutions responsible for determining their own research and development objectives and activities. This would help to guarantee that unitary choices cannot be imposed by the agency at the center.

Second, the Institute must deal constructively with the misdescribed delivery system problem. The intensive debates within our own field about how research affects practice has increased our understanding of these matters. We know now that the results of knowledge-oriented or basic research cannot be directly applied in instruction very often; the knowledge must be translated in some way. Specific instructional techniques based on the new knowledge must be devised. The techniques can then be applied in the learning setting.

Our understanding of the importance of development as a process which stands between knowledge and its application has still not resulted, however, in a greatly improved situation with respect to the actual application of knowledge. The reason, I believe, is partly a function of the fact that most of the people who have been thinking about this problem come from the research community. The consequence is that primacy gets inadvertently attached to the research side of things. The problem is typically seen as how to get research results into practice. Not often enough is it seen as how can the real problems of practice usefully define what research and development needs to be done. The problem is seen as delivering things to practitioners, instead of, as I suggested a moment ago, turning practitioners into more demanding consumers.

The educational system can become an active and intelligent market for research-based innovation—or, putting it another way, the preconditions required for effective use of a delivery system can be stimulated and met—if the Institute will cultivate and install complete evaluation capabilities in the educational institutions and agencies throughout the Nation.

This idea will be very difficult to implement if the basic assumptions now underlying Institute thinking do not receive spirited examination and considerable reworking. The number of academics and scholars who already think along

the lines being advocated here is small; those willing to give up the status implicit in the existing basic assumptions are equally small in number. It is possible to find a somewhat larger number who will acknowledge the unfortunate policy implications of the so-called linear model—first research, then development, then demonstration, then application—and the degree to which the model has been institutionalized in American educational R&D and still seems to be the basis for new proposals like the Institute and the National Foundation for Higher Education. So far, the justification offered for the Institute suggests to me that the ideas I have developed here, knowledge acquired administering the research program and participating in numerous policy reviews, has yet to impact on the shapers of educational research policy in this Nation. Even at the top of the pyramid it would seem we have difficulties applying the findings of research!

Nevertheless, the Institute must make a major commitment to support and stimulate the development of evaluation capacities throughout the schools and colleges of the Nation. It would be foolish of me to suggest an exact proportion of effort on this score, but it might well be that the Institute should build up to as much as a quarter or a third of its budget in the early years for formula grants to State and local educational agencies for the conduct of such activities. Coupled with the grants should be substantial NIE technical assistance to help develop the necessary capabilities.

The third implication for the Institute has to do with the need to decentralize substantial portions of the Institute's research and development activities. While stimulation and support of evaluation in educational institutions is one important response to the decentralized responsibilities for management and administration. I believe it is also important that major responsbility for decisionmaking about non-school-based knowledge building and development activities exist outside of Washington proper.

This is entirely consistent with and, I believe, virtually mandated by the decentralized character of administrative responsibility for education and the need to preserve and enhance a rich plurality and diversity of educational ends and means. Both NSF and OE have been forthright and responsible in their service of diversity, particularly in their support of multiple approaches in the many curriculum areas, but it has always been something of a battle for them. Institutional support for research and development activities to a number of institutions—perhaps ultimately as many as forty or fifty of different kinds—would contribute great strength to the educational R&D enterprise and be a much needed stimulus to preserving and enriching diversity.

HOW BIG SHOULD THE INSTITUTE BE?

I want to say just a few words about the question of scale. Unless sound judgments are made as to the proper scale of the Institute, you would be better off not raising expectations by approving it. Don't create an Institute only to make promises that will be broken. The last six years in the field have been replete with raised expectations, initial promise of delivery, and then retrenchment. No crop can prosper if it is pulled up and its roots examined every three weeks: no seedlings can flourish if after they sprout, they are denied water.

Roger Levien testified before you that the field is inherently less costly than other research fields. Four factors lead me to conclude the opposite. The dollar requirements for the educational research and development effort that finally improves education are probably substantially in excess of those in other fields. Let me try to explain why.

Earlier I talked about the political dimension of educational research and the requirements they created for a healthy diversity and plurality of educational ends and means. There is no one way to teach mathematics or the social sciences. The reasons for wishing to learn in these and other areas are even more diverse. One curriculum for a given subject at a given level of difficulty is bad policy as well as professionally unsound. The requirement that research develop alternatives for virtually every technique, curriculum area, or organizational form creates a cost burden which points in quite the opposite direction of "inherently less expensive."

Second, the special characteristics of change in education suggest the need for much more widespread participation in the processes of research and development. From participation come both commitment and understanding. One of the costs, therefore, that will have to be met if educational R&D is to improve

education is precisely the cost of the duplication of effort required to overcome the NIH factor—that which is not-invented-here isn't believed, doesn't get used, hasn't been heard of, doesn't intrude on our consciousness, or any combination of the above.

Third, I have spoken to the necessity of creating an intelligent and sensitive market for research-based innovation before R&D can have a significant impact on education. Strong evaluation or operations research capabilities must be built in the educational institutions and agencies of the Nation. There are fifty States and five territories. There are better than 18,000 school districts. There are several thousand institutions at the postsecondary level. It would not be unreasonable, I think, for all of these agencies together to spend up to one percent of their present total operating budgets on evaluation, planning, and other program development and assessment activities. Those funds will not be found in their current budgets. They must somehow be added on top of existing expenditures.

Fourth, there is one last idea which I have not yet had sufficient time to explore in detail. But I am beginning to think that educational R&D must come to be understood as necessarily including, as part of the development function of R&D, the retraining of professionals in the use of research-based innovations. If this view on more detailed examination should make sense, then it is clearly reasonable to include the bulk of in-service teacher and administrator retraining activities as part and parcel of the research-development-innovation process for education.

If we sum the cost of these individual activities that I have just cataloged, it is not unreasonable over the next twenty-five years to estimate the cost of the R&D function to be as much as 3 or 4 percent of the annual expenditures for education, or at current levels of funding, something between two and three billion dollars a year.

Making accurate judgments as to the proper scale of educational R&D's requirements is important. Sure judgments will provide the essential parameters for decisions on manpower and institutional development policies. Unless the Congress provides the Institute with a firm basis for making the necessary long-term decisions in these areas, decisions which are likely in the initial years to require considerable allocations of scarce funds, the Director and other managers of the Institute will be unable to stand against pressures to serve shorter term requirements thrust upon them by whatever Administration happens to be in power. The long view must be sustained for the Institute. This would be true for any research organization. But it is particularly true with respect to the implementation of those policies aimed at achieving the total scale of effort required to accomplish successfully its mission of the improvement of education.

SUMMARY

I conclude with a brief summary. First, I think that the unique dimension of research and development for education is its political character, its integral relationship to questions of choice and value. This is not present to the same degree or in the same way as in other science as it is practiced, and insofar as this is the case, other sciences do not constitute adequate models to copy for administrative or organizational purposes.

Second, the call for a delivery system fundamentally misreads the nature of the problem. What is needed is to turn practitioners of education into effective consumers of changes for the better. This will happen through the installation of effective and sophisticated evaluation capabilities. Once the demand is created, then the delivery systems will be devised and used.

Third, an effective R&D effort for education will be expensive. This is so because of the need to serve diverse and plural goals, to duplicate R&D activities in order to overcome the psychological phenomenon of the NIH factor, to support evaluation capabilities in all educational institutions and agencies, and to include in-service manpower development functions as part of the R&D process.

Translated more specifically into recommendations for the Institute, this means careful attention to provisions for legislative oversight, the advisory structure of the Institute, and the relationship of the Institute to educational agencies across the country including the USOE. It means attending to the wholesale creation of evaluation capabilities nationwide including major commitments of Institute funds and the provision of technical assistance. It means opening the decision structures of the Institute to the balanced and responsible play of political forces in the Nation.

I am aware that what my testimony proposes the Institute do may violate what many of you have come to understand is included within the definition of research or what is acceptable research policy. But what I am asking of you is to throw over your existing conceptions and think freshly with me about the problem as I have come to understand it over the past half dozen years. The problem is not what kind of Institute should be created. That is the solution. The problem is why research hasn't had much of a direct impact to date, and how it must be realized for education in the Nation. I feel confident that if you do think anew as I have asked, you will come out somewhere near where I have and certainly closer there than to the positions argued before you until now.

Mr. GIDEONSE. The three documents that I would like to insert are a reprint of an article that I did for *Science* entitled "Policy Framework for Educational Research"; a paper which I have done for the Teaching Research Division of the Oregon State System of Higher Education called Research and Development for Education: A Market Model; and a third document, a report of the examiners appointed by OECD when they conducted their policy review of educational research and development in the United States in 1969. That document will be printed by OECD, but as their presses grind exceedingly slow and they have not reached the print stage yet, I would like to put that in. The document I would like to call to the atttention of the subcommittee but not insert is entitled "Educational Research and Development in the United States." I prepared it as background to the OECD policy review and its was printed in the summer of 1970 by the Government Printing Office.

Mr. BRADEMAS. Without objection those documents will be inserted in the record.

(The three documents follow:)

[From Science, vol. 170, p. 1054]

POLICY FRAMEWORK FOR EDUCATIONAL RESEARCH

A SEVEN-PART STRUCTURE IS DESCRIBED FOR ANALYZING RESEARCH POLICY INITIATIVES

(By Hendrick D. Gideonse [1])

Major new research initiatives have been proposed by the Nixon Administration in the field of education. The President himself proposed in his education message that a new National Institute of Education be created to house, sponsor, and coordinate an improved and expanded federal effort in educational research and development. Experimental schools were high on former HEW Secretary Finch's priority list. Meanwhile, it is being suggested that existing programs be focused more sharply on problems of great importance, areas of potential promise, or outputs of potential impact.

These new initiatives follow a 3-year period during which educational R & D has been subject to no less than 16 studies or reviews, 13 bearing directly on the field or major portions of it and the remaining 3 embracing it as part of their broader concern for the behavioral and social sciences generally. The most thorough of the reviews was recently completed under the sponsorship of the Organization for Economic Cooperation and Development (OECD) (1). This review firmly documenented the absence of any *de jure* national research policy for education. Nonetheless, rapid development in this field in the past 4 or 5 years reveals the fact that considerably deeper thinking is required about research and development policy for education. Such thinking must be done to avoid costly financial and political errors. It must be done to move research in directions of responsible service to education and society. At the same time, however, the scholarly and academic requirements of a healthy scientific establishment for education must be met. It is in this light that I have developed the following framework for considering educational R & D policy (2).

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ELEMENTS OF RESEARCH POLICY FOR EDUCATION

There are five primary elements which appear useful for analyzing, developing, and implementing research policies for education. These may be conveniently identified in shorthand form as: (i) contexts; (ii) goals; (iii) research definitions, models, and descriptors; (iv) manpower and its location; and (v) decision structures. These elements are neither separate from one another nor hierarchical. Each is an essential component in research policy and interacts with the others. As each of the elements is described, therefore, their interactive character should be kept in mind. These primary elements embrace those essential notions which we must understand when developing and executing research policy. The interactions of the primary elements also lead to two secondary elements: priorities and objectives, and strategies and tactics.

CONTEXTS

There are at least four contexts in which research policy issues in educational R. & D. operate. These are: (i) social, political, economic, and philosophical contexts; (ii) educational policy issues; (iii) educational systems, both core and peripheral; and (iv) science policy.

The first of these, of course, is the broadest context within which educational research operates. Education exists to serve society and individuals. For example, we must have a knowledge of our past, as Lawrence Cremin put it (3), so that we shall not be tyrannized by our myths. We must have a knowledge of our present with its achievements and its problems. We must understand the alternatives open to us in the future. We must have some grasp of the philosophies which guide the nation's view of education and its understanding of children both as learners and as present and future citizens. In the understanding of these issues educational priorities emerge to provide guidance for substantive R & D.

The second context is education policy. The purposes and goals of our educational system form part of the structure within which research questions will be framed. This needs to be understood in terms of immediate, short-term, middle-range, and long-range goals. A good command of this contextual factor is essential.

The third context is the educational system itself. Educational research and development is intended to provide insights whereby educational functions can be improved. It is essential to know the established structures charged with or performing educating functions in our society, how they operate, what their traditions are, and how they view themselves.

We must attend not only to the core system but to the periphery as well. Not only do we have elementary and secondary schools, technical institutes, 4-year colleges, and universities, but we also have the home, mass media (particularly television), continuing education in business and industry, the military, the Peace Corps, VISTA, and so on. The core and the periphery are the institutions, agencies, and programs whose functions R & D will alter, improve, or supplant. They must be fully understood for effective and rational R & D programming and decision-making to take place.

Finally, the last context within which educational R & D operates is science policy. Resources available for R & D in education are part of the national resources for scientific research. As such, they come under the same policy review procedures for science in this country and compete with other requests for funds.

GOALS

The second primary element in the research policy picture concerns the goal for R & D. This may be an obvious point, perhaps, but it is an important one. By goal I do not mean the specific objectives, strategies, or tactics which are being supported or used at any given time. Rather, I refer to the way we view the ultimate purpose of educational research. We can see educational R & D in two ways. We can support and manage it because we are aiming to produce more knowledge about learning and instruction that *might* in some way or other improve education. Or, we can support it because our purpose is *to bring about* the improvement of education. In the first case the goal is the pursuit of knowledge. In the second, it is the improvement which is sought and the creation of knowledge becomes a means to that end.

The issue is never as black and white as I have presented it above, of course. But where the emphasis falls is of tremendous importance. Different clientele and constituencies become more or less important depending upon the choice

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taken. Perhaps even more important, if improvement is the goal, policy makers will find themselves much more deeply involved in political and social issues of educational output (or supply) relative to educational desires (or demand). The key word is "improvement." This means comparisons will have to be made between what is and what is desired. Issues involving costs, efficiencies, effectiveness, benefits, and interests of many kinds will daily consume the energies of R & D policy makers.

These concerns obtain under either the knowledge-choice or the improvement-choice. That it is more pervasive under the improvement-choice seems quite clear.

RESEARCH DEFINITIONS, MODELS, AND DESCRIPTORS

The third element is complex. It embraces our understandings about what educational R & D is and is not, how it "works" or why it doesn't. This element turns our attention to definitions of research, development, experimentation, evaluation, diffusion, dissemination, and demonstration. Here we are concerned with the various means for discovering knowledge and the means by which different kinds of knowledge find application in educational practice or policy. This leads us to consider the ways in which the many kinds of R & D functions might relate to one another under varying conditions and circumstances. This third element is concerned with the many natures of educational R & D and with the models we use to understand it, ask questions about it, and manage it.

Another dimension of this element is an understanding of the disciplines and technologies of educational R & D. The behavioral and social sciences, the information sciences, the humanities, and the biochemical sciences appear to cover the range in this field. (A new science just emerging may very well yield additional exciting areas for educational research in the future—the science of varied states of consciousness including hypnosis, research on hallucinogens, psychiatric research, autonomic feedback, and the like.)

Finally, with this element the policy analyst must decide how, if at all, educational R. & D. differs from other branches of science. For almost 6 years now I have been amazed that a field such as educational R. & D. so obviously in need of expansion should be the subject of so much foot-dragging, criticism, and controversy. The result has been extremely begrudging support from the public treasury whether local, state, or federal. We have wrestled with every aspect of the problem. Only recently have I been able to understand why this situation should be characteristic of educational research (and, for that matter, any mission-oriented behavioral or social science research program).

The natural, physical, and biomedical sciences operate on premises quite different from those in educational, behavioral, or social science research. The essential difference is that in the behavioral and social sciences virtually all of the objects of research or variables under study either possess free will (that is to say, they are self-conscious) or are inextricably embedded in a value structure of some kind or other.

I am not saying that the outcomes of physical and biomedical sciences don't relate to choice or values. Clearly they do. Nevertheless, the materials, units, and variables involved are not of themselves self-conscious, possessed of free will, or value-laden. Atoms do not choose nor do chemicals or glands. But learners, parents, society, and institutions do. Rats and mice possess no human values nor are human values involved in the intricacies of a high-energy physics experiment. But learning itself *is* a value. Failure of achievement in any large-scale experiment involving children or adults is a value question. Indeed, all matters involving education, welfare, or social futures are inextricably bound up in questions of worth, propriety, and preference.

What this means is crucial. If educational R. & D. or any mission-oriented behavioral and social science research enterprise is in its practice as well as its implications value-laden and choice-rich, then science as it supports education is as much a social and political activity as it is a scientific one. This is an extremely important, if complicating organizing principle.

MANPOWER AND ITS LOCATION

The fourth primary element in educational R & D policy focuses on how manpower roles and requirements are defined and where those kinds of manpower can be found.

For example, if we consider that academic researchers, scientists, and scholars should do educational research, we will look where such people can be found,

primarily in colleges, universities, and specialized research institutions. If, on the other hand, we believe that those who are likely to uncover new knowledge of benefit to education are those who are most familiar with education, then we might be likely to look to the professional faculties of education or operating school systems. Or, if we were to follow one interpretation of the political and social dimensions of educational R & D, we might look to practitioners, parents, or even learners as a source of manpower for such efforts. Any combination of the above, and perhaps other views not spelled out here, would be equally viable.

Here is the interaction of the primary elements. How we define the manpower requirements in part follows from how we define the field. And how we define the manpower and the field will determine what kind of manpower is available, where it might be located, and what it would require financially, administratively, or politically to utilize it effectively.

A word about reward structures. The operating principle here, colloquially, is "different strokes for different folks." What this means, simply, is that scholars don't get their kicks from the same kinds of things that school administrators do, and experts in development, diffusion, and so forth may well respond to still other kinds of reinforcement. This fact is particularly important for clarifying what kinds of response can reasonably be expected from different kinds of people performing a wide variety of R & D functions.

DECISION STRUCTURES

The last primary elements in educational research policy focuses on decision structures—what kinds of decisions have to be made, how they are made, and who makes them. As in each of the other elements, we ask not only what the situation actually is but what it ought to be. Obviously the interaction with other elements is critical. How R & D is defined affects the nature of the decision process and who is involved in it. So will the analysis of the contextual issues. Depending on the emphasis given to the role of the science policy context as contrasted to the educational policy or educational system context, differences will emerge in structure and in the personnel involved. For example, one traditional method of managing federally sponsored R & D programs is the system of approval granted by a panel. When an agency is not mission-oriented or is supporting fundamental research, this is an appropriate structure to use.

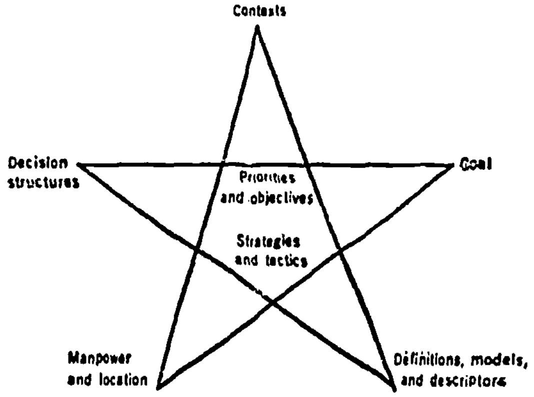
When agencies have more specific missions, however, this procedure must undergo a shift. Now the people selected to serve in advisory capacities must have the expertise required to decide what panels should sit in the first place, or what proposals should be requested, or perhaps even what research or development procedures should be followed.

Congress enters the decision structure when it approves the establishment of a research institute in NIH. Other staff personnel located anywhere in the federal government may successfully propose specific activities within the R & D program. When they do, they become part of the decision structure. Priority development mechanisms, planning procedures, and the arrangements depicted by the classic organization chart all comprise the decision structure.

The decentralized, multijurisdictional character of education in this nation is an important determinant for the educational R & D decision structure. There is no national educational policy which alone defines educational R & D priorities and objectives. Therefore, at the policy level, decision structures must link many types of institutions and agencies in the educational system. In actual performance, decentralized educational policy should lead to decentralized management of educational R & D.

How this fifth primary element of research policy interacts with others should be clear. If educational research is seen as a social and political enterprise as much as a scientific one, then the decision structures will reflect that. If people other than a scientist are involved in making educational R & D decisions, then they must be accommodated at the appropriate time. In general, the decision structures established for conceiving, planning, and implementing R & D programs in education must be designed so that they agree with the other four primary elements.

I have already suggested a few of the ways in which the primary elements interact with one another. There is a useful way of explaining this interaction so that it can be clearer. Two secondary elements emerge as the result of interactions among the five basic ones. There are: (i) priorities and objectives, and (ii) strategies and tactics. The interaction of the five primary elements in the total framework is illustrated in Fig. 1.



PRIORITIES AND OBJECTIVES

The development of priorities and objectives arises from the study of what society needs from its schools in the short-, middle-, and long-term period, compared with what it is getting. It is also based on an examination of the state of knowledge, the technical arts, and what R & D manpower is available to work with in the deficient areas (*4*). When these areas are identified, it then becomes possible to propose alternative objectives which will correct the deficiencies. Various criteria such as cost, benefits, scale, political acceptability, sequence of development, and so forth are of assistance in reaching decisions.

STRATEGIES AND TACTICS

Similar interactions among the primary research policy elements determine R & D strategies and tactics. There are many different ways of carrying out research and development programs. The management strategies will depend in part on what needs to be supported, who is to play a role in that kind of activity, what the decision structures are or ought to be, and what models or conceptions of educational research the decision maker finally has in mind. A point to consider in this interaction is the conception of what kinds of manpower are required to play what sorts of roles, and what sort of settings they are to be found in or in which they will be expected to do their work.

The usefulness of this policy model must finally be tested by applying the primary and secondary frames of reference developed here. Three policy proposals currently before us provide useful illustrations of how exposure to the kinds of questions suggested by this analytical framework can be beneficial. They are: (i) directed planning and programming of educational R & D; (ii) experimental schools; and (iii) the National Institute of Education.

R. & D. PLANNING AND PROGRAMING IN THE OFFICE OF EDUCATION

The Office of Education has gradually been assuming responsibility for substantive direction and management of portions of its research and development program. In prior years OE's research program was almost wholly unsolicited; shifting that orientation has proven to be a complex, difficult, and sensitive task. With the new administration attempts have been made to strengthen the organization and location of the research effort. Renewed attention is being paid to how we might identfy priorities, establish R & D objectives, and manage a substantial portion of the program to achieve those objectives.

Recently, as part of this general effort, an effort was made to develop some initial statements of purpose, objectives, and strategy focusing on a single priority area suggested by former Commissioner Allen's announcement of goals on 4 November 1969. Of three major goals which he identified, one was stated in the following way:

> The development of a nationwide strategy for maintaining a continuing process of improvement and relevance in American education. To achieve this goal we shall need to formulate a systematic, coherent plan for linking

the processes of educational research, development, demonstration, evaluation and dissemination which will help get the best in material and procedure more quickly into practice by making them readily available in useful form to those who control, manage, and teach in our educational institutions.

Accordingly, a special working group was set up to explore the ways in which we could go about identifying specific objectives relating to this goal, and to make recommendations for action. Even before the group began its work, judgments about research policy had in effect been made. For example, stating the goal constituted implicit judgments about educational policy issues and the state of the educational system, as well as a judgment that research and development regarding this problem either was or could be made sufficiently coherent to develop a structure for directed programming. Similarly, by deciding to engage in a managed R & D effort, an explicit decision was in effect being made that there might be a new decision structure in this area at least (that is, the Office of Education would accept the responsibility and perform whatever linkage and coordination functions were riquired to accomplish the management task in a responsible and acceptable manner).

Soon after the planning group undertook this particular effort it became clear that they would need to articulate their understandings about research models for education, and how R & D functions relate to operating educational programs, institutions, and agencies. Of particular interest to operations researchers, for example, was the conclusion that so long as we were being asked to produce a research and development program designed to assist the educational programs of the nation, then it might be more useful to view our mission less from the academic research perspective and more from an operations research perspective. The planning group became convinced that, if education were conceived as a total complex interactive system, then mission-oriented R & D could properly be seen as operations research writ large; the R & D capability for the system should be though of as intimately connected and linked to the operating whole.

The planning group in arriving at this conclusion was not for a moment denying that specialized institutions like universities and research corporations will be needed. But they judged the potential effectiveness of specialized institutions to be much greater if schools, districts, colleges, universities, and states were to have their own research capabilities and carried out their daily activities as if they, too, were engaging in inquiry (5).

The working group's views of educational R & D shaped the planning effort in other ways. For example, we in OE concluded we did not know enough to carry out the complete job. But even if we had had sufficient expertise, we became convinced we shouldn't complete the job ourselves. Without engaging in a great deal of communication with researchers, policy makers, and practitioners during the program development process, no matter what we produced would have been viewed with skepticism and distrust. If the program were to be viable and used by the educational practitioners, everyone would have to be involved from the start. Again, this clearly reflected convictions regarding the political and social dimensions of educational R & D as an activity.

The development of strategies and tactics for a directed R & D program on educational organizations and systems provides further examples. How acceptable would certain approaches be on face value to the constituencies on whom we depend for either political support or for performing the work? What sorts of modifications might be desirable to further develop and enhance such support? Or, keeping a firm eye on social need, real or perceived, how much if anything should we sacrifice in scientific elegance in order to achieve some measurable benefit now rather than greater elegance and three times as much measurable benefit perhaps 3 years from now? This entailed some consideration of the strength of social demand, for example, relative to the quite different requirements of the academic community. Here we see an explicit interaction of two different elements, social and political context and manpower and its location, an interaction made especially difficult, perhaps because of the operation of different reward structures and motivations.

EXPERIMENTAL SCHOOLS

A second illustration can be developed in connection with the request for funds to establish experimental schools.

Here is an example of a proposal founded on an understanding that educational practice and achievement are based on or employ, to good effect or bad, a very large number of variables and that many of these must be utilized

simultaneously before substantial positive effects on student achievement will be observed. It is an R & D program emergent from some understandings based on previous research and development.

Operating again within the framework of the third primary element, it is useful to note exactly what experimental schools are and what their purposes are. Are they to experiment with new products and techniques to see what effects they have when combined with one another in the context of an entire school? Are they to demonstrate new and tested products and techniques to show others how they work so that the innovations may become more widely diffused? Are they to test new departures in the conceptions which underlie our establishment of schools or, to borrow T. S. Kuhn's notion, to experiment with the very paradigms on which instructional and educational practices are based (6)? Are they to be designed to mount the first sophisticated cost-benefit studies of educational practice? Are they to find out what works for target groups and areas where schools are presently failing?

Each of these purposes is different from the others. Some are compatible with one another; others are not. Some will use certain kinds of people; others will use different ones. Some will be very costly; others will be less so. Some will require very long periods of time for planning and community consent; others might require only a few months to initiate.

Decision structures will be involved. Where will initiative for experimental school proposals reside? What role might program managers here in Washington play? What will be the role of the community in which the school is ultimately established? What kinds of criteria will be required and who will develop them, within which project proposals and program designs are established and evaluated?

Consider manpower and its location. With one or another interpretation of purposes and definition, different kinds of manpower presently found in a variety of different places and institutions will be required. How can people be identified, located, interested, and employed? Or are they already in the schools where the experiments are to be mounted? And will the experiment be *in* schools or *by* them?

What of the larger social and political context? Where are the schools currently failing in the United States? What are the target groups that, as measured in terms of achievement, are not receiving an equal opportunity for education in this country? What roles do these areas or groups of people have in the experiments in deciding what should be done and perhaps *whether* they should be done? How will black militancy, community involvement, and demands for self-determination be an essential frame of reference for this program?

NATIONAL INSTITUTE OF EDUCATION

Finally, on a third and much larger scale, let me list briefly some of the questions the framework suggests regarding the proposed National Institute of Education (NIE). The Institute proposal envisions nothing less than a total reconstruction of the administrative structure for R & D efforts in support of education. Not only is it designed to create a new atmosphere and climate for educational research, but ultimately it will absorb many of the R & D activities presently administered by OE. It is intended to play an important coordinative role with other related R & D efforts scattered across the federal structure in such agencies as OEO, NIMH, NICHD, NSF, and the Defense Department.

Certainly one of the central points, if not the most central one, deals with the degree to which NIE can or ought to be thought of, in Moynihan's terms, as "modeled shamelessly on the National Institutes of Health" (7). Recall again the descriptive differences between educational research (and in fact all behavioral and social science research) and other kinds of research, say, in physics, natural science, or biomedicine. Educational research is interwoven with issues of choice and value. Any agency responsible for administering such research must, first of all, build the political decision structures which will constitute the necessary enabling condition for success (8). I am not suggesting that the proposed Institute cannot meet this requirement, but it must if it is to succeed.

The policy framework suggests that care must be exercised in establishing the Institute so that linear models of research and development (with their hierarchical flavor stemming from the implied primacy of the importance of research) are not adopted to the exclusion of others. Such models carry obvious logical power. They are the ones most commonly used to describe how science contributes to technological and economic advance.

But for reasons associated with the peculiar characteristics of behavioral and social science research, I suspect that other models—for example, those emphasizing practitioner initiative and involvement—may well be far more important for understanding the role of science in fostering educational improvement. We speak, for example, of "an idea whose time has come." In social fields the "whose time has come" part of the phrase is far more important than the "idea." The conditions that create a readiness in a social field to accept an idea from science are more important as far as adoption is concerned than the idea itself. Hence we find a peculiar dual phenomenon in all social fields. On the one hand, we observe the nonadoption of strong ideas in the absence of readiness. On the other, we see faddism, which is nothing more than readiness to adopt, in the absence of knowledge, a readiness which is soon disappointed by the low power of the innovation. If education is to be improved by science, the conditions causing practitioners and policy makers to pay attention to the ideas emerging from science must be established parallel to and as part of the support of science itself.

Extending the argument a little further, then, it may well be that the type of research which most needs stimulation, development, and support is the kind of inquiry that must be conducted in the operating educational institution. This is the research that determines who the learners are (in all their richness and detail), what the schools' operations actually are, and what effect those operations have relative to intended accomplishments. In a word, operations research may be more important. The question then become how the Institute can foster this kind of research.

SUMMARY

A policy framework for analyzing educational research and development has been proposed. The framework consists of five primary elements focusing on the contexts in which educational R & D operates, its goals, its characteristics, its manpower, and its decision structures. These five primary elements interact to produce two secondary elements concerned with priorities and objectives, and strategies and tactics. The framework was applied to three current policy proposals in educational R & D including directed R & D programming in the U.S. Office of Education, the request for funds for experimental schools, and the proposed National Institute of Education. Rigorous application of the framework to major policy questions such as these three can help us examine issues before they arise. It can help prevent errors. Its application can provide greater assurance that primary, secondary, and tertiary consequences—those that arise from the interaction of the consequences we most directly perceive—will receive examination. This kind of consideration can help produce the desirable and intended effects and avoid the detrimental consequences of unanticipated impacts in unintended areas.

REFERENCES AND NOTES

1. The status study prepared in connection with this review is now available [*Educational Research and Development in the United States, OE-12049* (Government Printing Office, Washington, D.C., 1970)]. Chapter 10 of the report presents a detailed summary of all but the most recent of these reviews. For a brief summary of the OECD policy review, see H. Gideonse, *Educ. Res.* 21. 5 (April 1970). Later in the year OECD will publish in one volume the status study, the report of the four examiners who were responsible for conducting the review, and a summary of the confrontation session between the examiners and an American team held 19–20 November 1969.

2. When I drafted this article on April 1970, I referred to the possible application of this framework to other behavioral and social science research programs. Since then I have had two opportunities to confront the possibility that research programs directed to social services other than educational (such as welfare, corrections, and housing) might also profit by using the framework. It probably is applicable, but I am not professionally familiar enough with these other areas to adduce the evidence. In the event that study should document the usefulness of this framework, it might be possible with appropriate content modifications and additions to see it as a framework for policy formulation in any mission-oriented behavioral and social science research program.

3. "American Education: Notes Toward a New History." AERA-Phi Delta Kappa Address, American Educational Research Association Annual Meeting at Minneapolis, Minnesota, 4 March 1970.

4. I have discussed these matters in chapter 6, *Educational Research and Development in the United States* (1).

5. Compare R. J. Schaefer, *The School as a Center of Inquiry* (Harper & Row, New York, 1967).

6. A number of examples of this approach were presented by John Mays of the Office of Science and Technology at the Annual Meeting of AERA in Minneapolis, 5 March 1970.

7. White House press conference, 3 March 1970, mimeographed, p. 1.

8. Borrowing an idea from Theodore Levitt, another way of saying the same thing is that the Institute must link itself closely to its several markets and not fall into the error of thinking, because it has command of such good science, that of course it has something to offer (sell) to education.

9. I thank Maurice Kogan, of the team of OECD examiners, for his help in the development of the framework presented here. This paper was written in the author's private capacity with no official support or endorsement by the U.S. Office of Education.

RESEARCH AND DEVELOPMENT FOR EDUCATION: A MARKET MODEL

(By Hendrik D. Gideonse)

0.0—INTRODUCTION

The second successive national administration—a Republican one this time—has embraced the cause of educational research and development. The Johnson Administration revised the basic authorizing legislation in 1965 and called for the establishment of a network of educational laboratories "large and significant, . . . comparable in their way to the large-scale laboratories of the Defense or Atomic Energy establishments. . . . equal in size and scope to the major tasks they seek to accomplish."[1] The form of the Nixon Administration's embrace has been the submission of legislation to create a National Institute of Education "modeled shamelessly on the National Institute of Health."[2] The backing and the promise seems high. Why then are we in such a muddle?

Much speculation and discussion—and even some careful study and analysis—have been devoted to the role of research and development in improving educational practice. Major policy explorations have been completed, most recently the policy review conducted under the sponsorship of the Organization for Economic Cooperation and Development (OECD).[3] Commissions, study groups, White House-appointed panels, inter-agency review committees at the Federal level, and other groups have addressed smaller or larger segments of the problems.[4] The result of all this examination as far as policy is concerned seems to be a peculiar immobilizing self-consciousness.

Politically the field of educational research has been in a state of disarray. Under fire from the Congress, the Bureau of the Budget (now the Office of Management and Budget), the Office of Science and Technology, staff offices of the Department of Health, Education, and Welfare, other Associate Commissioners in USOE, the Chief State School Officers, the White House, and a swarm of self-appointed critics in and out of government, USOE's research programs have struggled, stuttered, and somehow survived, but each time at a slightly heightened level of exhaustion.

Now, barely four years after the last set was launched, new initiatives have been proposed. USOE has been pressed, for example, to move the management of the program away from the development of institutions to carry out R&D and toward the identification of specific research and development objectives which will govern the management of the program. The new proposal for a National Institute of Education which has been forwarded by the President to the Con-

[1] Letter from President Lyndon B. Johnson to Secretary John W. Gardner, July 5, 1966.

[2] Daniel P. Moynihan, White House press conference, March 3, 1970.

[3] For a brief summary of the OECD review see my "OECD Policy Review of U.S. Educational R&D." *Educational Researcher*, April, 1970. The status study I prepared in connection with the review has been published by the Government Printing Office and is available under the title *Educational Research and Development in the United States* (OE 12049) from the Superintendent of Documents, GPO.

[4] For a report of this large number of studies, up-to-date through December, 1969, see Chapter X of *Educational Research and Development in the United States*. At this writing (March, 1971) two more reports should be added. One was prepared by the President's Commission on Instructional Technology and issued in August, 1969. The other was prepared by Roger Levien of the RAND Corporation under contract to United States Office of Education as a planning study for the proposed National Institute of Education.

gress envisages a complete, wholly unspecified, but much needed upgrading and reorganization of the management and administration of educational research and development at the Federal level. The companion proposal for a National Foundation for Higher Education, while it appears to be a clear overlap of the proposed new Institute's functions, deserves mention, too. Finally, a new program of experimental schools originally proposed by former Secretary Finch has just been launched. Its appropriation for the first year exceeds the sum used to launch the first ten educational laboratories in 1966.

All of this has the Congress, the Chief State School Officers, the various and sundry parts of the Federal establishment, and various constituencies attendant to educational research programs hyper-excited, skeptical, horrified, hopeful, confused, and groggy at one and the same time. It should hardly be surprising, therefore, that accepting the assignment to prepare this paper has taken on for me something of the character of "going to the mountain."

What better time could be found to take the most common, widely distributed, and basically linear and hierarchical notions about how research and development can improve educational practice[5] and explicitly turn them on their head? I proposed in this paper that what is most likely to advance the field of educational R&D is not further worry and concern about the current state of the art in educational R&D or the nature and interrelationships of R&D functions and processes.[6] What is needed instead is for us to develop a highly sophisticated, imaginative, and unyielding concern for the market being served or created by educational R&D, that is, for the consumers, the clients, and the users of the outcomes of such research.

1.0—A FEW WORDS ABOUT MODELING

Why develop models? What is their purpose? How can they be useful?

A simple answer is that models help us understand; they give us a sense of order to the "blooming, buzzing confusion." They help sort out functions, ideas, or activities. They help clarify relationships among elements.

But this simple anwer is clearly not sufficient itself. It only raises the question why we want that understanding. And the answer, I think, relates to some kind of instrumental need, a desire to do or accomplish something. Thus, we model to understand *in order* that we can make better decisions, manage better, change, self-fulfill better prophecies, and so on. A critically important point, this means that models are constructed with an eye to some kind of purposive action. Because this is so it seemed to me important to try and sketch out my goal for the educational system as far as educational research was concerned.

As I developed this paper, therefore, I tried at the same time to create a vision of the educational system as it might look if it were functioning with strong scientific support. This exercise, begun originally as part of my responsibilities as Director of Planning for USOE's National Center for Educational Research and Development, enabled me to move backwards and forwards in a continuing means/ends analysis. The conception I emerged with at the end of the appointed time for preparing this model can be found at the end of the paper. It is by no means complete, but I include it because it does provide the reader with some idea of the purpose I came to have in mind as I developed this particular model.

A second point respecting models is the usefulness of pointing out the distinction between conceptual, logical, or ideal models and descriptive or empirical models. Models can describe present conditions or they can describe ideal states as possible future conditions. Both kinds of modeling are useful, but it is important to be clear which is being attempted. In the case of this paper, the model is future-oriented to a state of affairs conceived to be desirable.

A useful caveat is that being purposive, modeling itself is a contextually related activity. Consider, for example, a complex system like a "muscle car." The position such a mechanical marvel holds in the conceptual systems of a highway patrolman (e.g. a potential law violator or perpetrator of serious accidents), a twenty-two year-old male (e.g. an aid to amatory success), or an ecologist (e.g.

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[5] The basis for this statement is to be found in conclusions drawn by the four OECD examiners during the course of their policy review of American educational R&D. The full report of the review is unfortunately not yet published though more than a year has elapsed since the completion of the policy review.

[6] This tremendous concern for R&D functions and processes seems not to be repeated in any other field and is, I suspect, an outcome of two related phenomena: the supreme and long-prevalent methodological consciousness of educational research and the basic insecurity about our pretensions to scientific status.

a serious example of human excess in terms of the drain on human and natural resources and the pollutants added to the sky-sewer) suggests the importance of knowing where the modeler stands and what his purposes are.

The same point can be made regarding a research project or a conceptual model. To the university research administrator, the Senator exercising Congressional oversight, the Federal research manager, the scientist directing the project, and the graduate school dean who worries about financial assistance for two or three fewer graduate students, the project or model occupies a considerably different frame of reference. Thus R&D policy for education may be considered from the point of view of research scholars, policy-makers or practitioners in education, or from the peculiar vantage point of the student of social change. The same "objective" element tends to occupy very different places in the scheme of things depending upon who's doing the scheming, what his purposes are, and what the operative reward or incentive structures are.

Given these kinds of understandings about modeling, it is important to state that what follows is future-oriented, instrumental, ideal rather than actual. and oriented more toward the contextual settings of policy-makers for educational research and development rather than performers of such research or the users of its results.

Applying this view of modeling to the immediate task, if I am asked why model educational R&D, my response is that I wish to understand it better. And if I am then asked why, I reply that I want to understand it better so that R&D management can be improved. And if I am then asked why I want to improve research management. I am pushed to a still higher order goal. My response is that the ultimate interest is in improving the service of our educating institutions to learners of all kinds.

Means-ends analyses of this type are important because the characteristics and requirements of ultimate ends tend to shape the means that are chosen. They establish important parameters on action by projecting their shadow backwards from the desired goal or purpose to the present real field of action.

Hence it becomes important to know what the frame of reference of the modeler is, how he views the ultimate end toward which his model-building is aimed, and what his operating assumptions are about the field or problem on which he is working.

2.0—BASIC ASSUMPTIONS

It is important to identify what assumptions have been made in order to be able to undertake modeling, to know what the modeler takes as his givens.

Certain assumptions or judgments have been made which affect the process of developing a conceptual model of the application of research and development to education. In the present instance I have been able to identify three areas where basic operating assumptions need explication. These areas are the political and social character of behavioral and social science, the character of change in large social systems, and the political structure of education.

2.1—Unique characteristics of behavioral and social science

Much has been said about behavioral and social science. It has been called "soft" as opposed to "hard." It is dreadfully under-supported *vis a vis* the entire science budget in the Nation. It is oftentimes controversial and tends to be subjected to much more careful scrutiny than bio-medical or natural sciences.

All of these statements are true. The point I would make here, however, underlies all those mentioned above and I think serves in large measure to explain them. They key question is how, if at all, the behavioral and social sciences (of which educational R&D is a part, in fact, the largest part) differ from other branches of science.

For more than six years I worked as an administrator and planner of educational R&D. Month after month, year after year, I found myself continually amazed that scientific inquiry in the field of education should be the subject of so much foot-dragging, criticism, and controversy regarding policies, procedures, and support. No one appeared to understand what was being done or, if they did, agree with it. Everyone wanted to study it interminably.[7] Financial support

[7] And despite the study, it is amazing how little seems to have been learned if the criterion is altered behavior on the part of policy makers. Thus we have the spectacle of a Counsellor to the President and his staff on at least two occasions *after* the decision had already been made to press for the National Institute of Education (and presumably the staff work completed justifying that choice) offering the following evaluation of the field of educational R&D:

A. The Coleman report showed certain target groups in American society were not

since the original burst of enthusiasm in 1965 has been begrudging, and, in terms of purchasing power, declining. The political scraps and antagonisms within the Federal executive establishment, between it, the Congress, and the research community, and between all three and the educational establishment have been wondrous to behold. The result of the controversy has been disappointment, delay, procedural aberration, systematic encroachment on established administrative authority, and executive timidity.

Only recently have I been able to articulate why this should be so and how the fact that it is, is probably the single most important characteristic of mission-oriented behavioral and social science research.

Let me phrase it in the following way. The natural, physical, and bio-medical sciences work on variables or entities that are different from those worked on in behavioral/social science research. The essential difference is twofold. In the behavioral and social sciences virtually all of the objects of research or variables under study possess (or act as if they believe they possess) free will and, second, they are inextricably imbedded in a value structure of some kind or other.

Let me be very clear about what I am saying here. I am not saying that the outcomes of physical, bio-medical, etc., sciences do not relate to choice or values. Clearly they do. What I *am* saying is that the materials, units, and variables with which and on which they work are not themselves self-concious, posessed of free will, or value-laden. For examle, atoms do not choose nor do chemicals or glands. But learners, and parents, and society, and institutions do.

Rats and mice possess no human values (though we may anthropomorphize them from time to time). Neither are human values involved in the immediate intricacies of a high-energy physics experiment. But learning itself *is* a value, failure in its achievement in an experiment involving real children or adults *is* a value question, and all matters involving education or welfare or social futures are inextricably bound up in questions of worth and propriety and preference.[8]

The understanding is crucial. *If behavioral and social science research is in its practice as well as its implications value-laden and choice-rich, then science as it is practiced and managed in support of education is as much a social and political activity as it is a scientific one.* This is an extremely important, if complicating organizing principle. Its implications are far-reaching. It affects who does research and development and where it is done. It forces a reconsideration of the decision-structures which should exist for a behavioral and social science research program not only at the policy level where the objectives and targets are identified, but also at the technical level and perhaps even within the R&D operations themselves.

A political and social conception of behavioral and social science renders more immediately meaningful the remark attributed to Bernard Berelson when asked what he had concluded, having completed a huge compendium of research in the social sciences. He replied that the social significance of a research study is inversely proportional to its scientific quality.[9] While apparently anti-intellectual on the surface, Berelson's remark reminds us that it is people, not things, who are affected by the behavioral and social sciences. And if the people who are to use that knowledge cannot understand it or if it is so esoteric as to have little credibility,[10] then one can question in what sense it is "knowledge" or whether it should be imbued with power to affect decisions of any kind.

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being served by the schools as evidenced by their non-attainment of equal distribution curves of achievement.

B. The report further showed that the reason for this was that there did not exist adequate differential arrangements for the allocation of instrumental resources (e.g. dollars, trained manpower, curricula, techniques, etc.) so that equally distributed achievement patterns could be produced by the schools for varying target groups.

C. If educational research and development had been performing well, it would have produced those techniques and systems of differential resource allocation.

D. Since they do not exist, educational R&D has clearly failed.

E. Therefore, we need a whole new initiative in this area.

On the basis of the *Coleman Report!* After having listened to this analysis about all one can wish is that the Counsellor in question had read his own words on the misapplication of the social sciences in the cause of policy development at the Federal level!

[8] Another way of saying the same thing is that in the behavioral and social sciences men are inside the systems being studied rather than outside. While the physical sciences are beginning to encounter some analogous problems as the act of measurement alters the phenomena under study, the implications for the behavioral and social sciences of perception, judgment, feeling, attitude, and value are clearly much more problematical.

[9] Reported by Lewis Eigen in *Reappraisal of the Educational Technology Industry,* Urban Research Corporation, 1969.

[10] Because it has either sharply limited the variables or related them to one another in complex mathematical ways.

2.2—Change processes in social systems

A second basic assumption or operating principle focuses on the process of social change. The argument is easy to sketch out. The educational system is a social system. The purpose of science is to develop understandings or knowledge which hopefully can be applied in some fashion or other to achieve desired human ends. The application of science to human or social systems is rarely a process that can be accomplished purely by decisions taken at critical points or times in the administrative structure.

Change in a social system is not so much logical as it is psychological, social, or political. We speak, for example, of an "idea whose time has come." What this means is that somehow a widespread willingness has developed to accept and act on the basis of a new conception or knowledge of some kind. But the phrase also implies a bit of knowledge in its own right, namely, that in social domains the "whose time has come" part of the phrase is far more important than the "idea." In other words, the conditions which create a readiness in a social field to accept an idea from science are more important as far as adoption is concerned than the idea itself.

Hence the twin phenomena we find in all social fields. On the one hand we see the nonadoption of strong ideas in the absence of readiness. On the other, we have faddism which is nothing more than readiness to adopt in the absence of knowledge, a readiness which is soon disappointed by the low power of the innovation. The point is simple. For the improvement of education to come from science, the conditions causing practitioners and policymakers to attend to the ideas emerging from science must be established parallel to and as part of the support of science itself.

2.3—The political structure of the educational system

My assumptions should also be clarified respecting the political structure for education. At present the educational system in the United States is multi-jurisdictional in character. Primary initiative for policy rests by constitutional authority in the States. Most of the States have in turn delegated this responsibility to local school districts. Any purposive model of educational research and development needs to address head-on what its assumptions are about the present and future character of the major decision structures for the educational system as a whole.

In this regard I want to make clear my assumptions that policymaking respecting instruction and curriculum will continue to be decentralized. I hold this view not because that is the way it is now and, being strong, it is likely to continue that way. Rather than seeing such a situation as anachronistic (as many people do these days though perhaps not openly admitting it), decentralization is very much the direction that is being made possible and is in fact occurring in a variety of other areas in the contemporary world. The communications revolution and, cliché though it may be, the general elevation of the level of popular knowledge make possible and indeed create demands for decentralization that would have been thought inconceivable (if not undesirable) a decade or two ago. The telephone, the xerox machine, and the mass media assure the availability of information to large numbers of people. The immediate presumption is that good communications strengthen the center by making it possible for everybody to get the right word. What actually happens, though, is that people who are close to the action now not only know what *they* know, but they also know what the policymaker at the *center* knows. In such circumstances the demand to make decisions at the periphery will be loud and insistent. This trend is likely to continue at, I believe, an increased rate.

These assumptions respecting the political basis for the institutionalization of education is nationally specific (meaning that it is linked to a particular culturally imbedded structure for education). My conclusion that it is dovetails with the earlier expressed view of the political and social character of behavior and social science. It is a different point, however, not an identical one.[11]

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[11] An observation here might be useful regarding the degree to which this assumption of decentralized policy development and execution and the assumption about the political and social character of behavioral and social sciences relate to one another. I recently attended a UNESCO-sponsored working party at which we discussed the application of systems analysis to the problem of innovation in education, with particular reference to educational technology. One of the key items on the agenda was the consideration of what the UNESCO Secretariat called conversion strategies or what is referred to in this country more often as diffusion or change process. That the question was as much political and philo-

3.0—A MARKET MODEL OF EDUCATIONAL RESEARCH AND DEVELOPMENT

From the basic assumptions and other considerations developed above—the purposes and contextual relatedness of modeling, the political and social character of the behavioral and social sciences, and the socio-psychological dimensions of change in social systems—I am led to one compelling conviction. *Educational research and development must be conceived in terms of the market, consumers, and clients it is supposed to serve. Only after that principle is firmly established should attention be directed to the processes, techniques, and functions which might accomplish that service.*

Prerequisite to the application of science to education is the examination and redefinition of what the education market is, what it means to consider clients or practitioners as a "market," and how to translate market requirements (conceived either in present terms or desired future terms) into product or outcome statements that will provide useful guidance to the development and management of research and development policies and practices. Successful innovations derived through research and development are more likely to arise from careful consideration of market requirements or possibilities than from the theoretical or technical possibilities emergent from R&D by itself.[12]

3.1—A Conceptual Turnabout

Ten years ago Theodore Levitt, writing in the *Harvard Business Review*, analyzed the phenomenon of growth industries.[13] He was interested in exploring what a growth industry was and what kind of advice he might give regarding any given industry's position with respect to such growth. Levitt concluded that there was no such thing as a growth industry *per se*, only far-sighted, successful management. He concluded industries were threatened, slowed, or stopped not become markets were saturated but because there had been a failure of management.

Levitt presented brief analyses of railroads and the Hollywood film industry as classic examples of old "growth industries" gone sour. He described dry cleaning, electric utilities, and oil as industries in the shadow of obsolescence. He concluded that there was no such thing as a growth industry, only "companies organized and operated to create and capitalize on growth opportunities." Levitt indentified four conditions which usually guaranteed the cycle of bountiful expansion and undetected decay:

1. The belief that growth is assured by an expanding and more affluent population.

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sophical as it was instrumental became clear as important differences emerged between Cartesians and empiricists, between French-speaking and English-speaking, and between nationals from centralized systems and nationals from decentralized systems. The English-speaking, empiricist, decentralized system representatives seemed generally to worry much more about change process than the Cartesian, French-speaking, centralized system participants.

Several intriguing questions arise from this observation. For example, to what extent are we observing an instance of the Whorfian hypothesis that language carves out the reality we see? Does the logical-derivative character of French as a language affect their perceptions of change problems in ways different from the empirical-generalization character of English? Does the language itself only express the differences implicit in basic philosophical distinctions between empiricists and rationalists which in turn tend to produce decentralized vs. centralized educational systems? And most intriguing of all, does what one *believes* affect in an objective way the kind of problem which exists? For example, the Americans and English tended to give short-shrift to the notion of the printed word as an effective conversion strategy. But the French and Belgian representatives *insisted* that for them publications were not only effective but essential, especially if the publications came from the center.

This aside illustrates some of the dimensions of the problem with which we wrestle as we build models, and in particular, the possibility that in the field of behavioral and social science policy we may not be building universal models but rather national or culturally-specific ones.

[12] These conclusicns were formulated well before I encountered a monograph published by the National Science Foundation (NSF 69–17), *Successful Industrial Innovations*, by Sumner Myers and Donald G. Marquis. After stating their primary conclusion that technical changes was to a significant extent based on the cumulative effect of small, incremental innovations, their second conclusion was that 'recognition of demand is a more frequent factor in innovation than recognition of techical potential." (p. 60) In fact, in only 21 percent of the over 500 innovations studied was the primary factor the recognition of technical potential. The only caveat I would make respecting the idea of a market model is that I am not referring here to any notion of "free market economies" wherein that which sells best is "best," or somehow foreordained, or good. In short, sales are emphatically not the criteria which determine success. The criterion referent which is most important, ultimately, is client satisfaction—are individuals and the society receiving from education what they desire?

[13] Theodore Levitt, "Marketing Myopia," *Harvard Business Review*, July–August, 1960, pp. 45–46.

2. The belief that there is no competitive substitute for the industry's major product.

3. Too much faith in mass production and in the advantages of rapidly declining units costs as output rises.

4. Preoccupation with a product that lends itself to carefully controlled scientific experimentation, improvement, and manufacturing cost reduction.[14]

Levitt's article then analyzed these four conditions in some detail. The central conclusion that he arived at was that healthy industries see their primary role as customer-satisfying rather than goods producing.

"An industry begins with the customer and his needs, not with a patent, a raw material, or a selling skill. Given the customer's needs, the industry develops backwards, first concerning itself with the physical *delivery* of customer satisfactions. Then it moves back further to *creating* the things by which these satisfactions are in part achieved. . . . Finally, the industry moves back still further to finding the raw materials necessary for making its products."[15]

Of course there are some obvious problems in directly applying the form or the conclusions of any analysis of the production of goods or the health of a business or industry to the social service domain. But there are intriguing points of comparison which can be made. For example, we might define the customer's needs as those skills requisite for success in school and the delivery system choices as inschool mechanisms, or new institutions like Head Start, preschool television programming, or whatever. Educational development would then entail constructing the programs, organizational models, instructional sequences, and staff capabilities. And the raw materials would include the knowledge base in both its specialized forms and as it exists widely diffused about us all.

But the most important comparison of all is the distinction between producing goods (or services) and satisfying customers. The key point for the purposes of this paper is that those industries that have maintained a posture of satisfying customers have thrived; those that have concentrated on producing goods have either stabilized or gotten into serious difficulties.

Applied to educational R&D Levitt's conception leads to a fundamental reorientation of the status hierarchies implict in classical research-development-dissemination-adoption (R–D–D–A) models of educational research. It suggests, for example, that before research and development can be used ("bought" in the literal and figurative senses) it must be delivered and before it can be delivered it must in some sense be needed (even though the need may have to be "created" rather than merely identified as pre-existing). A market model suggests, therefore, that attention to the conditions for change precedes the search for and development of specific chances. It suggests that how we are to reform and improve education shapes how we define and use research and development to that end.[16]

The market model entails giving up as futile the idea that the educational system will change as a consequence of external levers of research and development. Rather than being the lever of change, research and development is the fulcrum. Adoption of a market model for conceptualizing and managing educational research and development, however, should be done with the understanding that it is largely contentless with respect to specific models of the interrelationship of various research, development, or research-related functions. In that sense, the market model defines the game, not the game plan. Linear models might fit. Linkage models might fit. Output models, process models, or feedback models might also fit.[17] While later on I propose ways of conceiving of research and development which seem most generally compatible with the market notion, the point is that examination of the conditions, reasons, and requirements for change within the educational system itself is the first necessary step in the improvement process.

Another implication of the market model is that the primary referent of concern should be the client (conceived of either as learner or educational practitioner—more on this later) rather than scientific theory. This is similar to

[14] *Ibid.*, pp. 47–48.

[15] *Ibid.*, p. 55.

[16] This, of course, is the reverse of the operating assumption the OECD examiners encountered in their discussions across the United States with researchers, developers, and policy-makers of different kinds. They found the most prevalent view was that how research and development was pursued would determine how the system would change and in what ways. In short, the examiners discovered a much stronger belief and concern for the product and its potential efficacy than for the market or customers being served, however the latter might be identified.

[17] See Chapter I of *Educational Research and Development in the United States* for discussion of the terms used here.

Levitt's idea but casts it specifically in terms that are more commonly associated with educational research. By asserting the prime importance of the client and the practitioner, it makes all the participants—theorists, scientists, engineers, policy analysts, teachers, administrators, and the learners themselves—*equals* in a transaction (after Eric Berne) process. The central feature of that process is co-equal presentation of needs, knowledge, problems, and possible solutions. The status hierarchies implicit in some models of research and development dissolve in the market model and are replaced by transactional processes of confrontation, bargaining, or negotiation among equals.[18]

3.2—How is "market" to be defined?

One of the most powerful features of the market model is that it forces consideration of who the market really is when discussing educational research and development. For starters, what seems quite clear is that the market is *not* primarily researchers and developers operating in the field of education. While saying this may be obvious, much of the rhetoric spun out over the past ten years or so about educational research and much of the actual decision-making respecting educational research has had the operational effect of attending more to the needs of the R&D community as a market than to schools, practitioners, parents or children.

The market model focuses attention in quite different directions. It leads to questions about which market, how we are to conceive of it, and what our time frame is.

3.2.1—Is the System Or the Client the Market?—The first prime issue arising from the market model stems from considering who the market is—the system which carries out educational functions or the clients being served by that system? In short, whose needs (should) define the market?

Careful attention reveals that as an economy, education, like all social services, must be considered in a rather different fashion. In most market economies with which we are familiar, the consumer, ultimate purchaser, or user are all the same person be he individual or corporate. For social services, however, the ultimate client or user is only rarely the direct purchaser. In fact, it would be far more accurate to say that the ultimate client for education, relative to the service being offered, stands more often as recipient rather than consumer.

In a sense, I am playing a word game here, but it is an important one. For by the term "recipient" I mean to imply a degree of passivity. This can be contrasted to the more active, capable-of-demanding-accountability implication of the term "consumer." In fact, the buyers of behavioral and social technology for use in education are almost always intermediate to the ultimate beneficiary. The fact that the market as purchaser is intermediate to the market as ultimate recipient of services is of crucial importance. The market model causes this question to be raised in head-on fashion.

A second sense in which attention needs to be directed to the issue of who the market is and who the client is lies in the classic tension between individuals as clients and the society as client. Heightened focus on the market and how it is defined assures that this concern will not be glossed over. No claim is made here that only a market model will cause the individual/society issue to come more sharply into focus. Rather, it appears only that such issues are more likely to be addressed systematically and continuously as a consequence of the particular perspective that the market model affords.

3.2.2—Actual or Present Markets vs. Ideal or Future.—A second key issue surfaces almost immediately. Should existing needs as currently defined by client groups (in either sense as discussed above) constitute the market or should the market be conceived in terms of needs defined if conditions and understandings were as they should be? Does a market model require that customers be satisfied only immediately or in the long run, too? Does it mean that R&D has to provide products which meet felt ("low-level") needs or can it hope to meet real ("high-level") needs?

[18] This conception seems entirely compatible with ideas developed by Sam D. Sieber in his paper "Images of the Practitioner and Strategies for Inducing Educational Change," Bureau of Applied Social Research, Columbia University, February, 1967. Sieber presents four strategies for change based on the images of the practitioner as rational man, cooperator, powerless participant, and status occupant. He analyzes each in terms of the locus of change, the channels of influence, the change agent, and the efficiency of the change measured in terms of effort, coverage, and yield, Siebers preferred status occupant strategy based on the writing of Merton and Gross, Mason, and McEachern, while using quite different language and concepts, comes very close to expressing the same kind of transactional concept identified above.

I have deliberately used ambiguous and perhaps loaded language in these questions. I wish only to make clear that there is an issue here which needs to be dealt with. It can be perhaps most bluntly explicated by stating that there are any number of people in R&D and academia who believe that they know better what the needs are than clients or practitioners do. Whether the belief is justified is a problem in its own right—a political problem, too, I might add, since it deals with fundamental questions of who has the right to define and choose means and ends in this domain.

One way to deal with this kind of problem is through the systematic use of means/ends analyses and in rigorous comparisons of actual accomplishments to those which are desired. Means/ends analyses can help resolve the market question by producing rigorous dialog focusing on whether that which is desired will really have the effects or outcomes intended. Attending to discrepancies between desired and actual achievements of the educational services will similarly yield important input for resolving which needs statements of practitioners or clients have priority (presuming, always of course, that the statemeans of desired outcomes have legitimacy and standing).

What is most important, however, is the pressure to hold a dialog between clients (or their representatives), practitioners, and performers of R&D to iron this question out in a manner satisfactory to all. We come back, in short, to the notion of a continuing transactional process among equals.

Other terms for considering this question are more common to industrial research operations. One finds reference in such settings to concepts of "defensive" and "offensive" research. Defensive research is that undertaken to improve the efficiency, effectiveness, or cost of existing products, services, or functions. Offensive research is that conducted to develop wholly new product lines serving newly defined customer needs or which replace an existing product by one which comes at the need in a wholly new way.

Thus defensive research by a corporation would improve detergents; offensive research would work on synthetic fabrics which resisted or prevented soiling. Defensive research would improve gasoline for auto fuel; offensive research would allocate large sums to the development of acceptable electric or steam automobiles. Defensive research would improve teachers' behavior in the classroom; offensive research would develop home television programming which attempts to guarantee that children will enter school with an established competence in reading, writing, speaking, and listening.

Perhaps most important, however, in considering actual vs. ideal markets for education is the problem of delivery systems. Levitt asserts that after needs are considered, the first thing to be addressed, even before a product or service is defined, is the nature and adequacy of the systems f r delivering customer satisfaction. This point is critical, especially for the educational system organized as it is. Decentralized, hierarchically structured in the bureaucratic sense, it is curiously "flat" if the object is to reach nearly three million teaching professionals. All sorts of innovations might conceivably be designed, tested and validated, but if there is no delivery system, then they can be introduced only with the greatest of difficulty, if at all.

It is with respect to this issue that some of the most difficult problems will surely arise. The existing system is not geared for renewal. Its structure does not provide easily for the continuing education of professionals; its incentive systems do not stimulate individual initiative as in other professional fields.

Here is where the vision of an ideal system sketched in at the end of this paper may serve a dual purpose. Not only does it constitute an important part of the conception underlying the market model, but it comprises a beginning statement of a more ideal market as a delivery system. It constitutes, therefore, a reference point in the future against which certain kinds of change-enabling R&D work might usefully be done.

3.3—The Conceptualization of Research Functions Under the Market Model

Conceiving of R&D functions in a market-oriented fashion helps get us out of at least one box in which we have struggled periodically. Over the past few years a number of analytical tools have been developed to help plan and manage research programs. At first it was thought that if we could develop clear, simplified terms grouped in such a way that all the terms in a given class were mutually exclusive, we would have powerful tools which could then be used to decide where funds should go for R&D purposes. Several times we tried playing what we came to call the poker-chip game (e.g. if you had 100 poker chips how would you allocate them to the categories in this particular class or dimension?).

This proved satisfying until we realized that it still did not tell us what should be done within each category with the dollars represented by the chips. Further, we realized soon that the allocation of dollars within single classes became immediately suspect as soon as we moved to the consideration of allocations within second, third, and fourth classes. The relevance of this to building conceptual models lies in the fact that one of the classes or dimensions in which we tried to play the poker chip game embraced the categories of research, development, demonstration, dissemination, training, and construction. In the context of this paper, the discovery that it was no more useful than any other dimension for decision-making means that considerable caution should be exercised in using a conceptual model based on classification schemes of R&D functions as a basis for R&D policy and decision-making.

What we learned is that for purposes of planning and allocating resources, it is the problems, goals, and objectives which must be firmly in mind, rather than taxonomies. Once the goals and objectives are determined (and that is a political and, I would argue, a market analysis process) then it becomes possible to derive what the specific activities and, therefore, allocations ought to be.

Lest these comments appear totally destructive of taxonomies let me hasten to add that they are still useful heuristics. They help to inform policy-makers by insuring that all the options have been explored and that in decision-making nothing has been inadvertently omitted from sight or consideration.

The conclusion of this brief discussion of taxonomies, however, must be that developing a taxonomy of change processes or research functions does not appear particularly useful as a conceptual model for research and development if the purpose of the model is to provide guidance for top-level policy development, planning, and execution.

Most research models developed in the past have addressed attention to how the several functions identified in various taxonomical approaches to research and development relate to one another conceptually, chronologically, empirically, or administratively. The market model suggests that those functions should be viewed in terms of their relationship to increased customer (client) satisfaction. In this light the definitions and views developed below are offered.

The key distinction which requires delineation is that between research and development, between science and technology.

The purpose of research or science is the production of verifiable knowledge. The purpose of development or technology is the creation of capabilities to perform specified functions or achieve specified outcomes where that capability did not exist before. Both definitions are broad and therefore require further elaboration.

First research. Michael Reagan has effectively disposed of the problem of distinguishing between basic and applied research in the behavioral and social sciences by the simple expedient of denying its meaningfulness. Reagan pointed out the many reasons for being dissatisfied with various of the proposed criteria for making the distinction. More compellingly, he also demonstrated that there is virtually no research which might conceivably be done in behavioral and social science which could not be easily connected to a real potential policy application of one kind or another.[19]

If the basic and applied distinction holds little promise for our purposes, application of the market concept begins to look a little more useful. Basically, it is possible to identify two potential user classes (markets) for the knowledge products of research. Ongoing or proposed research can be classified into that which will be primarily useful to other researchers and that which is primarily useful to decision-makers of one kind or another.

That research which is useful to other researchers will tend to be theoretically oriented, looking for clues for further research, micro rather than macro, interested in exploring a few variables rather than many, and so on. For research oriented to decision-makers, it should be possible to specify what decision might be made on the basis of the research *before* it is completed. It will deliberately play with many variables rather than a few, be more frequently macro, and so on. (An important type of decision-oriented research would be those many studies launched explicitly to further the achievement of a specific, identified development goal. Each study undertaken within such a frame of reference is clearly decision-oriented in terms of the development goal identified.)

The distinction proposed here is not a new one. The National Academy of Education volume, *Research for Tomorrow's Schools*, proposes that we consider the differences between conclusion-oriented and decision-oriented inquiry.[20]

[19] Michael D. Reagan, "Basic and Applied Research: A Meaningful Distinction?", *Science*, Volume 155, March 17, 1967, pp. 1383–1386.
[20] Lee J. Cronbach and Patrick Suppes, editors, The MacMillan Company, New York, 1969, pp. 19–27.

While they include development within the category of decision-oriented inquiry, it makes more sense to me to exclude it and preserve the distinction only within the research or science domain itself.

Second, development. The definition that I offered above is broader than most. Its breadth is a consequence of the basic assumptions which led me to the market model.

In education we have come to understand that development is a systematic process resting insofar as it can on the knowledge produced by science. The objective of the process is to create products, materials, techniques, and processes which accomplish, at an acceptable cost, objectives specified in advance and deemed desirable or required by learners, professionals, or society. These are the usable products of R&D, or in Levitt's terms, the things which are designed to satisfy the customer.

The broader definition (development as the creation of capabilities that did not exist before) is the consequence of important differences in the production and delivery of new capabilities in behavioral and social technology in comparison to "hard" technology.

Once a capability is demonstrated in computer sciences, electronics, aircraft technology, or housing construction, the further delivery of the capability is typically one of selling and purchasing a hard product. We know where to go to buy it; once we've bought it, it's ours.

Social and behavioral technologies are different. They cannot be bought in the same fashion. Much more frequently the application of social technology means the painstaking development of a new skill or technique in a vast army of people who currently occupy the professional positions in the social service field in question. On the view being offered here, the development process is not completed until the requisite skills and human capabilities have been successfully incorporated in the professional repertoires of practitioners.

In summary, I would make three points. The first is the reinforcement given the idea that the leading distinction about R&D activities pertains to the outputs of those activities.[21]

Second, more careful thought needs to be addressed to the expanded definition of development. At the present stage of thinking, however, it makes good sense to include the development of professional capabilities respecting the newly created behavorial or social technologies for education as part of the development process. Conceiving of it as part of development would assure direct attention to this problem by developers and those who make decisions to support development. It also tends to underline the critical role of practitioners in the development process. Finally, it suggests important modifications which soften the unfortunate unidirectional implications of existing concepts of diffusion and delivery systems.

Third, more careful attention needs to be given to decision-oriented inquiry for education. My own preference would be the broad extension and installation of something like the CIPP model of evaluation (context, input, process, and product evaluation) throughout the agencies and institutions engaged in or relating to the practice of education. This proposition is another way of saying building in and using an operations research capability in educating agencies of all kinds. Evaluation broadly conceived as in the CIPP model is a research activity aimed at decision-makers of various kinds and at various levels. The better and more sophisticated the inquiry in the name of evaluation, the more useful it is to the decision-maker.

3.4—Implications for Decision Structures

The model clearly stresses system or client need over R&D process capability. This focuses attention on the importance of collecting and analyzing data on client desire and need, societal need, school performance, and educational output. Data on these different factors then need to be placed in some kind of decision format.

The specification of educational ends and the allocation of educational resources to achieve those ends is a process which takes place at many levels in our society. It occurs within schools and other educating agencies like the home or the mass media, within local and State educational agencies and their governance structures, and within the Nation. This process is one in which we all participate as citizens, in more or less direct or immediate ways. While as professionals or scientists we may have a role in saying what is feasible, in the

[21] Cf. my "Research, development, and the Improvement of Education," *Science*, Volume 162, Nov. 1, 1968, pp. 541–545.

choice of ends we have no greater or lesser status than any other human beings.

Decision structures are important because they are the framework for determining what the desired outcomes of research and development activities are or what targets R&D should attempt to reach (by target I mean the production of specific desired end-states for learner-client groups or client systems). The market model requires a considerable opening and clarification of the decision-making process in educational research from its present relatively closed and muddy state. At the Federal level, for example, only a relatively small number of groups presently have effective access to the decision-making process. Even this is a smaller set than seeks access. The market model implies that many groups—those that have been seeking as well as those who have not yet been seeking—deliberately need to be brought into more formal, substantial, and public processes of decision-making on educational R&D at the national level. The marketplace in education is a political marketplace. Its decision structures need to reflect more fully that phenomenon.

What is true at the Federal level is even more true at State and local levels. But here the emphasis is somewhat different. If the ends educational R&D are serving are political, then political structures need to be created or utilized to determine them. But if the educational system is decentralized and the determination of educational policy is thus also decentralized, the model suggests that unlike natural or bio-medical science, much more attention needs to be directed to the role of local and State educational agencies regarding the organization and performance of research and development functions. This should extend as well to the determination of certain kinds of R&D objectives. This is even a more difficult problem than the Federal decision structure since at present there is very little of such involvement (with the notable exception of the regional educational laboratories) and, perhaps even more significantly, there are so few R&D activities to be found in State and local agencies to make meaningful involvement even desirable.

Finally, a third way of viewing the implications of the market model for decision structures for R&D is in terms of the transactional processes implied by this way of viewing the research and development world. In psychoanalytic terms the old "father-son" (hierarchical) relationship of research to practice (or of therapist to patient) gives way to a negotiation process of "adult to adult" where both researcher and practitioner (or therapist and client) expect to change in significant ways as a consequence of encountering one another. While difficult to operationalize in the abstract, drawing out the implication in this way should lead to interesting and perhaps provocative insights regarding the present realities of the relationships currently being displayed by participants in R&D and thereby suggest some new directions that might profitably be explored.

The idea of negotiation, bargaining, or consensual processes as a key element in decision structures for educational research and development is a reflection of at least two fundamental propositions resident in the model. It is based in a recognition that R&D processes are linked to one another in complex ways. Primacy of input from one or another of the participants in any linear fashion is virtually impossible to establish. Second, negotiation as a concept also flows naturally out of the idea that the practice of research and development in education is a social and political process as well as a scientific one.

It is possible to think of several examples of new decision structures for research and development which might be constructed on the basis of the principles described above. One which appears to have some merit and ought to be carefully considered is the idea of holding public hearings across the country on a regular basis (perhaps every two or three years) in order to secure systematic input leading to decisions as to what kinds of development activities to launch. By providing an opportunity for the many constituencies of schools and within schools to present their ideas about what is needed, a much more substantial basis will have been built for making decisions. The choice of public hearings is not a happenstance here, but rather an explicit attempt to employ a technique used by political bodies (legislatures) for an R&D area which also has strong political dimensions.

A second possibility is to make much more systematic and open use of "administrative lobbyists." While legislative lobbyists are often subjected to sharp criticism (and they sometimes deserve it) it is a well known fact that our legislative system could not function without them. Conceiving of, identifying, and then making use of adminstratve lobbyists might well be a way of assuring a continuing contact with important interest groups in education who can provide information and expertise and who also need themselves to be informed by scien-

tific developments and technical possibilities which seem to be emerging from the work now being done.

Use of groups like this has been sporadic and unsystematic. It has been guided more by vague notions of sharing information (but not too much) and trying to "build constituencies." Even the latter aim has been more often viewed as necessary because of the threat of their negative influence rather than necessary because research in education is of its essence political and therefore linked to the market it is designed to serve. Using professional organizations, either through their professional staffs or their members, to build their contributions into planning and program development in a regular way would be an important alteration in existing decision structures.

A third possibility fully compatible with the two suggested above would be systematically to make all program documents associated with educational research available to key groups for comment. This would apply not only to the Federal program but to State research programs and perhaps even the basic program documents of such large research organizations as educational laboratories and research and development centers. Such procedures would assure opportunities for various constituent groups to provide information, advice, and feedback. Information of this kind can provide useful correctives or materially strengthen existing or proposed initiatives.

A fourth possibility, more in the nature of feed-forward than feedback, is to take the simple expedient of publicly announcing the dates by which certain kinds of decisions have to be made or documents have to be prepared. This would provide an opportunity for strongly motivated or interested individuals and groups to submit data, analyses, or proposals respecting the direction and development of the research program or its several parts.

Finally, a fifth possibility is to press for much closer and more continual Congressional oversight of educational research and development. This idea, advanced several times within the confines of the Office of Education during the past three or four years, was regularly—I am tempted to say routinely—rejected as likely to cause more harm than good.

Up to the present time Federally supported educational research programs receive virtually no public hearing. Appropriations hearings in the Senate have tended to deal with the matter in a perfunctory manner; in the House the appropriations hearings are held in executive session. The current legislation authorizing educational research is somewhat unique in having no expiration date, but the consequence of this is that the matter does not come up before the substantive committees of the Congress.

The legislation proposing the National Institute of Education offers some promise of change. Public hearings are being held, but even the bill as currently drafted makes no provision for regular oversight hearings if it should be enacted. Certainly one way in which decision structures could be made to reflect more adequately the political dimensions of educational research would be to render the Congressional oversight function more explicit and more frequent. This recommendation will not be popular among the administrators of research or certain segments of the science community but it is rather directly implied by the propositions underlying the market model.

The above listing does not exhaust the possibilities, but it does give some illustrations of the kinds of techniques which might be explored. Key criteria for decision structures designed to reflect affinity to the market and the political character of educational research would be openness, accessibility to all appropriate groups and individuals, and responsiveness in the face of that access.

3.5—The Market Model and Institutional Development

If research managers and policy makers adopted the market model how might they come to view the needs for institutional development of the rich panoply of research and related functions suggested in Section 3.3?

Probably the first realization is that, regardless of the model of research managers in the past may have held (if indeed they held any at all), what has happened in this country is largely an institutionalizing of the calsic linear model. Like all generalizations pertaining to social enterprises, this one can be faulted by individual cases here and there. But I think it is nonetheless an accurate one.

Virtually all of the activities classed as research, for example, are to be found in the universities. As a group the Research and Development Centers funded by the Office of Education are primarily research operations. Some of them, to be sure, have moved to prototype development when theoretical groundings appeared to have the strength which would justify such a step. The educational

laboratories, while displaying considerably and, to my mind, extremely healthy and stimulating diversity, are basically either development institutions or serving as linkage mechanisms between existing development and school and professional audiences. Demonstration activities have been the province of Title III of the Elementary and Secondary Education Act. Thus we have a picture of different stages of the R-D-D process being independently institutionalized.

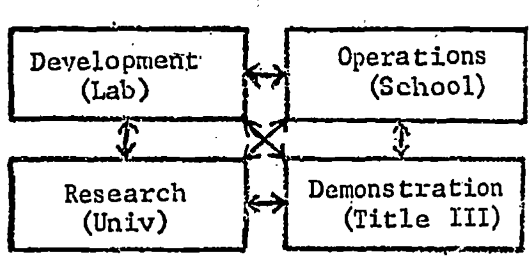
In practice, of course, there has been no—or very little—flow between these institutions to justify any claim that they fulfill the requirements of the linear model of R&D. While a couple of instances of such flow can be found in the relationships between R&D Centers and educational laboratories—notably Pittsburgh and Research for Better Schools and Stanford and the Far West laboratory—by and large not much has moved from the work being done by those institutions primarily engaged in research through those primarily engaged in development to those primarily doing demonstrations and finally to operating schools and colleges. In some ways it would be surprising were it so, since the programs are so new it would be difficult for the relationships to have been established and in the case of Title III and the laboratories, the demonstration projects were awarded before the development institutions were even created.

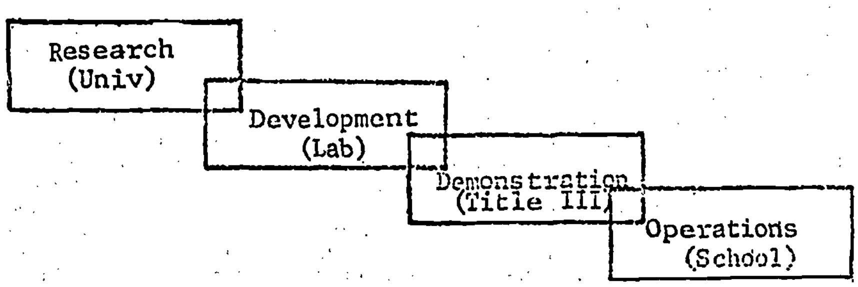
If the present situation respecting the institutionalization of educational research and development were to be illustrated graphically it would look something like the illustrations presented below. Each box constitutes a separate institution.

The top illustration fits the R&D models which distinguish the several functions, but do so in a non-linear though linked way. The bottom illustration depicts the classical linear model.

The market model suggests a radically different way of conceiving of institutionalizing research and development functions. Instead of defining research functions in terms of their relationship to one another, it becomes possible to define them in relation to what their outputs are and who might use those outputs.

The next step is to inquire as to the range of potential users. In most instances these are intermediate clients. Immediately we can identify State and local educational agencies, colleges and universities, educational laboratories, the United States Office of Education, the projected National Institute of Education, and so on. Each of these institutions, the hypothesis goes, is a market. Each needs to have carried out by it or for it, in one fashion or another and with greater or lesser degrees of sophistication, activities analogous, identical, or closely-related to the functions—research, development, and demonstration—we have come to call research or research related. Graphically, this would be illustrated as in Figure 2.





UNIV	LAB	SEA	LEA	NIE
r	r	r	r	r
d	d	d	d	d
d	d	d	d	d
a	a	a	a	a

A research team, for example, does more than just research. It develops research designs or new methodologies. It demonstrates their effectiveness by carrying them out, hopefully in a successful manner.

Development teams do research when they determine what kind of a development task to undertake or what knowledge appropriately underpins the different tasks they might undertake or when they solve the puzzles which continually confront them in the development process. Demonstrations are important testing exercises for such teams.

Demonstration programs search out the latest innovations, carry out operations research activities to insure that they have installed the demonstration properly, and carry out staff development activities to insure that the new programs will function as intended.

And operating schools carry out a variety of decision-oriented or evaluation research activities. They are continually engaged in staff development, and every successful adoption is a kind of demonstration of their continuing capability to meet new challenges and needs.

Once we accept the basic hypothesis that all institutions or educating programs—the ones listed above are only examples—require or perform functions analogous to the basic functions indicated in the classical research-development-demonstration terminology, then new possibilities begin to open up for institutionalizing systematic inquiry in the educational systems of the Nation.

Earlier attempts to define what was and was not research were basically exclusionary in their purpose. The idea was to figure out what to eliminate from view as unworthy or inappropriate. The view being pressed here adopts the reverse posture. What should be *included* as a legitimate part of a broadly conceived thrust toward the establishment of systematic inquiry wherever it might be needed in education? The emphasis is on transactional equality rather than status, on inclusion rather than exclusion, on the empirical rather than the logical.

Policies respecting institutional development of research for education would reflect the decentralized nature of decision-making in educational practice. Rather than reserving to the center responsibility for the bulk of the decision-making about research and development, national research management would seek to decentralize power—both authority and responsibility—for major portions of the R&D effort.

This, of course, directly contradicts the basic assumptions on which science policy operates today. While allowing argument and "partisanship" within the scientific establishment around theoretical issues which have not yet been settled, natural and bio-medical science, which encompasses 97% of the present Federal investment each year in R&D, assume the ultimate ability to discover objective truth. It is basically pyramidical and cumulative in its assumptions. The operating assumption, therefore, is that the best, most up-to-date scientific talent should make the decisions as to what research to support. Since the best talent is unevenly distributed across the country the central funding

agency is required to collect the elite together periodically to make the crucial allocation decisions.

This kind of thinking needs to undergo significant alteration. An example of the thinking that needs to be changed here can be seen in the recent history of the appropriations for vocational education research. In 1968 amendments to the Vocational Education Act required that half of the research appropriation be distributed to the states on a formula basis. The Bureau of the Budget refused to request funds under this authorization, ostensibly because of the budget squeeze, but apparently a major consideration in their decision lay in the requirement that funds should be distributed according to formula. BOB's argument was that research capability was not evenly distributed across the country and that to appropriate funds in this fashion was a dangerous precedent.

Of course, their arguments are based on the characteristics of the natural sciences. Equally important, in the absence of a rationale more suited to the growth and development of the behavioral and social sciences, their policy constitutes a classic example of a self-fulfilling prophecy at work. It is precisely the correct policy to assure that the capability does not develop!

Attention to the market, to the locus of actual need, will lead to policies of institutional development which face the fact of decentralized decision-making. This ought to take at least three forms.

One of the strongest needs that the market model suggests ought to be served is the cultivation of research techniques associated with the identification and definition of operational need. The entire range of research activities, most of them probably still to be invented, encompassed by the term evaluation or operations research needs to be cultivated and encouraged. This cannot be done in any other way than as broadly and as uniformly as the institutions which need such aid. All of them do. Economies of scale would suggest the importance of concentrating first on large State and city school and university systems, but the need is equally great wherever formal institutions for carrying out educational functions exist. Furthermore, the range of techniques and mechanisms ought to be as broad and varied as the types of institutions and agencies, and the goals and objectives which they are attempting to serve.

A second major thrust would be the deliberate attempt to stimulate the creation of autonomous institutions, scattered across the country, designed to undertake and carry out their own self-defined research and development activities in support of education. The educational laboratories were an important beginning at this. The attempt should be put back on the original track from which it has been shunted as a consequence of executive impatience, the financial squeeze, and mistaken understandings of role, function, and social science policy.

Finally, a third policy which would grow out of understandings about decentralization and the markets being served would be the continual searching out of alternative ways of cultivating research capabilities. The policy ought to be one of carefully husbanding new initiatives, new forms, new techniques. This requires a degree of awareness, a kind of patience, and a sense of the long view of things difficult to sustain, but it must be done if the full promise of systematic inquiry is to be developed for education.

The emphasis I have placed here on the decentralizing implications of the market model should not be interpreted as being pressed at the expense of a strong central influence. The management at the center desperately needs the upgrading of status and role contemplated in the proposed establishment of the National Institute of Education. It desperately requires the infusion of new managerial and analytic talent that the upgrading of status will permit.

This general elevation of role, however, needs to be undertaken with a friend and sensitive understanding of the issues I have been discussing in this paper. Nothing would be worse for the projected Institute than if it were to conceive of itself as modeled on the National Institutes of Health or the National Science Foundation. It is in a different business, with different interests, and different clientele. And one of the most serious missions it will have to perform is to figure out just how to develop the best, most appropriate mix of work which it performs or decides upon and work which it leaves to decentralized agencies to identify and undertake.

3.6—Implications for manpower development

Two key implications emerge from the market model respecting manpower development. The first pertains to the development of the skills of systematic inquiry—the research skills, the science competencies, the capabilities associated with engineering and development. The second focuses on the idea of markets,

the way in which they are defined, and the capabilities required to assess and respond to different responsibilities and incentive or reward structures.

Applied to manpower development policies it is clear that greater efforts need to be directed first to the training of people to carry out the research responsibilities of operating educational institutions and agencies and second to developing much finer sensitivities of the many different contexts within which personnel trained to carry out R&D responsibilities can expect to find themselves. The research functions to be performed within operating educational agencies are different from those which can be performed in more sheltered, university settings. The purposes they serve are different. The uses to which the products of such research are put are different. The reward structures vary. The markets being served are quite different and in varying states of sophistication respecting such concepts as the felt/real need distinction or the short-term/long-term distinction.

The emphasis to date has been rather heavily toward the academic marketplace. And within that domain it has been more toward the science side than the technology side. The market model suggests greater emphasis on the technology or development side, on the one hand, and on the research needs of operating school and university systems, on the other.

4.0—IF EDUCATION AND SCIENCE GET IT TOGETHER . . . A VISION

At the beginning of this paper I developed the view that models are purposive in character and that they depend on the frame of reference within which they are formulated. I also suggested that they ought to be created interactively with a conception of the goal being pursued. This concluding section sets out a vision of that goal. It is a sketch of selected characteristics of the educational system as it might be if it were integrally related to science and systematic inquiry.

4.1—The goal

The goal of the application of science to education is to build an educational system (a) whose ends, practices, and structures are based upon current knowledge, (b) whose operating philosophy has shifted from system maintenance to continuing system renewal, (c) which functions within a climate of awareness to desired and actual attainment, and (d) which as a whole, is increasingly accountable to multiple clients, both individual and societal.

The goal statement contains the element of *timeliness*. It addresses directly the question of relevance both for the ends of instruction and the means.

The goal statement refers to the application of *current* knowledge. It therefore implies that the service of science to education is a continuing phenomenon, rather than episodic in character.

The word "*system*" in the definition is intended to focus attention on interrelationships as well as elements. This goal statement is designed to encourage consideration of issues "up" and "down" the means-ends "ladder" (e.g., x is an end but also a means to something else, or y is a means, but because it doesn't exist it is an end we need to accomplish).

Finally, since systems of education and instruction are never content-less, the goal as stated avers that *goals and objectives* are a proper concern of science and systematic inquiry. This is not to say that science establishes what the goals or objectives of education should be. That clearly is a political or social responsibility. But science and scholarship must be used to illuminate the relationships between objectives and the consequences of achieving them and the fit between objectives and the particular means being employed to achieve them.

4.2—A scientifically-based educational system

We must first assume that major systems for schooling will continue to be supported under public as well as private auspices (critics like Ivan Illich, however, raise some provocative questions of doubt in this regard [22]) or at least that public support will continue to be available for the purchase of educational services of one kind or another.

What needs to be done next is produce a more finely-shredded "map," a scenario, if you will, which describes in greater detail what an educational system might look like if it were operating in terms of the goal as stated. In

[22] Ivan Illich, "Why We Must Abolish Schooling," *The New York Review of Books*, July 2, 1970.

developing these more refined statements it is clearly not possible to predict in detail what the system will be, what curricular or instructional objectives it will be serving, or how its several parts will interact. But it is possible to develop a vision of a selected range of operating characteristics of a scientifically-based educational system and to express the rationale behind that vision.

4.2.1—Governance, Assessment, and Accountability.—An educational system operating on a firm knowledge base and transforming itself continuously as that knowledge base evolves would reflect that circumstance in at least two ways that would be of special importance as far as governance, assessment, and accountability were concerned. First, the operating means of the system would reflect the extant and developing knowledge base. The techniques of instruction and the organizational structures of the institutions established to provide instruction would both be based on the most current knowledge about learning, the design of systems to foster learning, and the design of organizations and institutions to implement those systems. Second, a system based on knowledge would display a wider array of alternative forms to express the multiple ends the system is serving and the pluralistic outcomes desired by individuals and society.

These two conditions should lead to the development of governance structures and incentive mechanisms designed to increase the participation of students, parents, communities, employers, and other clients in defining instructional goals and governing educational institutions. More effective and actual school or college output. Confronted with the evidence of performance compared to desired achievement, teachers and administrators could either be left to their own professional consciences as to whether or how to alter practices, or public pressures might be mounted which would sooner or later produce the intended effect. The availability of effective and accurate assessment techniques would also be likely to stimulate alternative approaches to learning by creating formal routes to credentialling through assessment or appraisal which are real alternatives to the current time-serving requirements of schooling.

4.2.2—A Widespread Research Capability.—Assuming no change in the political structure of education, research capability would be widely distributed throughout the Nation. It would embrace research oriented to the improvement of theory and policy, engineering and development to build improved learning systems and the capabilities in professional personnel to use those systems, and other research related activities.

Much greater resources, proportionately speaking, would be available for research, development, and research-related activities. There would be substantially greater sophistication in the policy and management models used to administer R&D. The different purposes which could be served through science would be reflected in a much broader array of research and research-related institutions and/or functions than presently exists. Thus we would expect to find different kinds of specialized institutions carrying out research, development, and related activities but also an array of new functions within existing institutions. The research functions undertaken by schools, colleges, and other educating agencies would be equally expressive of and included under a broadened conception of research and development.

A much richer variety of techniques, instruments, methodologies and conceptions of educational research would probably be available. These would embrace the practice of research and development, its management, and the decision structures created to determine its policies and directions.

Finally, the training and development of manpower to perform research and related functions would no longer be peripheral to the system. It would be as central to the whole educational establishment as the training of teachers and administrators now is.

Rationale: A science-based educational system will require a science establishment and research functions distributed throughout. As is the case of the operating system itself, it is reasonable to expect, given current trends, that increasing differentiation of task and function will be the order of the future here, too. Furthermore, as the political and social dimensions of behavioral and social science become more clearly understood (and perhaps we will get some help here on the nature of knowledge in the social domain from epistemologists), it is likely that our conceptions of research and development will broaden with a consequent flowering of theories, methods, techniques, and approaches.

4.2.3—Flexible, Adaptive Organizations.—A solid research system producing new theories, new knowledge, new ways of doing things, and identifying new goals and objectives for education could be justified only if the institutions and

individuals conceived as potential users of new information or techniques were sufficiently flexible, "aware," and in control of their own resources to be responsible and intelligent consumers and producers of innovation. It seems likely, therefore, that a scientifically-based educational system would be comprised of institutions which would display rather different characteristics than the ones we find at present.

They would need to possess much more sophisticated techniques and staff capabilities for evaluating their own performance relative to desired and stated objectives. They would need to become active seekers of practices and knowledge to enable them to achieve their objectives more efficiently and effectively. They would, in short, have institutionalized the inquiry process.

An output orientation would characterize schools and colleges. As a consequence we could expect an increase in the articulation of different kinds of institutions and creditialling mechanisms with one another in terms of both levels and function.

The system would exhibit much greater differentiation of role and function within and between institutions. Such differentiation would be accompanied by greater decentralization of authority and responsibility for instructional and curricular decision-making.

Formal institutions of education and learning would exhibit much more sophisticated management systems and techniques for acquiring, processing, and using information in order to be able to justify and implement alterations in program. Flexibility would appear to require more efficient and sophisticated communications and a capacity for handling relevant information about processes and outcomes. Powerful and sophisticated information systems at several levels of organization would underlie the desired move to flexibility.

Finally, flexible and adaptive organizations would contain substantial mechanisms for continuing staff development. Some of this function might be performed as a consequence of the act of developing innovations; the competencies would be engendered by the act of creation. Other aspects of staff developments, however, would be formal training efforts built into the normal working day and expected of all instructional personnel.

Rationale: To make full use of the products of a solid science and research establishment, each part of the system would have to know what it is accomplishing, how it is being accomplished, and what is required to come ever closer to desired objectives. Information is seen as the basis, therefore, for flexibility (e.g., knowledge of needs and resources is the first requirement for determining alternative ways of allocating).

Information, however, is not the only prerequisite. Attention would also need to be directed to how institutions for education and instruction can be designed or structured to be able to make use of the information which they would have available. Flexible structures in the absence of information would tend to fall back into the familiar teaching patterns which now prevail. Information alone, however, is not likely to free up the eggcrate school or the lockstep teaching systems which are currently so prevalent. New incentive systems will have to be created and institutionalized as well. The current interest in accountability on the part of parents and the lay public carries the seeds of the new incentives which are likely to be brought to bear.

The reason why schools and colleges in a scientifically-based system are likely to have far different and much more evident staff development responsibilities is closely associated with the amount of continuing innovation such a system would experience. Institutions which constantly change need to prepare their staffs accordingly. Present practices which ostensibly send people elsewhere to receive their training look inefficient for such a system, even assuming that such away-from-school training could somehow be made more effective than it is currently.

4.2.4—Linkage Mechanisms.—An educational system tied to science and inquiry would almost certainly possess a continuously up-dated and universally accessible national knowledge bank with capabilities for searching for and retrieving data, research documents, reports of good practice, and the like. Capabilities for producing literature reviews of individual problems, objectives, or policy "targets" would be an important feature of such a system.

Capabilities would be developed to organize, translate, and "package" knowledge and tested practices in forms appropriate to the needs and characteristics of different potential users. Such "packages" might take the operational form of teacher training, demonstrations, interpretive materials, consultation services, and so on.

State and regional information capabilities would appear, facilitating two-way communication of information about educational needs and practices.

New manpower roles and functions associated with adoption and linkage functions would develop and firmly implant themselves as a vital component.

Rationale: Research on change processes in many fields has underscored the importance of linkage mechanisms. These mechanisms provide opportunities for meaningful two-way communication among specialized R&D communities, other knowledge producing mechanisms, and operating agencies for the purpose of diffusing knowledge and installing improved practices.[23] I know of no convincing arguments why the educational system should be exempt from this need and requirement. The application of research to practice is partly a problem of choosing the right kinds of research and partly a problem of devising usable applications through some kind of developmental process. But it is also a problem of making the products of both research and invention available to wider audiences than the immediate inventors. This is equally true whether the inventions are produced in specialized R&D agencies or in operating educational agencies.

4.2.5—Manpower development

A last set of characteristics focuses directly on the mechanisms for training and retraining manpower. Conceptually, there are obvious, indeed, already mentioned interrelationships between manpower development and flexible organizations research and development capability, and accountability, governance, and assessment procedures.

It would be my guess that a rapidly changing institutional establishment would almost certainly turn away from college and university-based training programs and toward internship, apprenticeship, or on-the-job continuing education techniques for learning new roles and functions. The schools themselves will take on training functions now being performed by colleges and universities.

Existing credentialing mechanisms will give way before performance criteria (in other words, the educational system will come to apply to itself the same kinds of accountability and assessment procedures it will increasingly be asked—or caused—to accept regarding its performance with *its* immediate clients. The more this happens, the more likely it is that schools will become the setting for teacher training and accreditation, both pre-service and in-service.

Lastly, the training of personnel would itself become the subject of a considerable amount of R&D. The training of professionals and sub-professionals in education would be characterized by much research attention to learning processes and outcomes and staff development techniques. Results would be measured in terms of competencies engendered rather than in terms of courses taken or time spent.

Rationale: Frequent changes in instructional content and processes will require changes in manpower and changes in manpower training. It seems likely that the same forces which will work on the system as a whole would also operate in respect to the development of manpower. More attention will be paid to what is needed in the operating system than to what is thought desirable by the training system. In other words, it seems likely that increased responsiveness of the operating system to clients will be reflected inside the system as well. Just as externally this will lead to new patterns of governance, internally this is likely to lead to quite different arrangements for the training of personnel. The investments that school systems make in the training of personnel will also be likely to lead them to adopt incentive systems for their personnel which will protect the system's training investment in them. This is likely to be a further stimulus for role differentation and radically revised salary structures.

5.0—SUMMARY

This paper presents a market model of educational research and development. The model is based on three assumptions: (1) educational research is a political and social activity as well as a scientific one; (2) change processes in social systems need to be viewed psychologically and sociologically rather than mechanically with the conditions for change being seen as more important than the

[23] cf. Ronald Havelock. *A Comparative Study of the Literature on the Dissemination and Utilization of Scientific Knowledge*, ED No. 029 171.

content; and (3) the political structure of education in this country is, and is likely to remain, decentralized. Oriented to the requirements of policy development and decision-makers, the analysis addresses the importance of identifying and defining client needs first, the availability of delivery systems to serve those needs second, and only then what innovations or knowledge might be required to create something that could be delivered to fill client needs. The market model dissolves the status hierarchies for decision-making implicit in linear models of R&D and substitutes for them transactional processes among equals.

The implications of the market model respecting the definition of "client" were found to focus on the classical distinction between individual and social needs and on the important fact that the consumers of innovations produced for the social services are intermediate to the ultimate clients.

The market model causes research functions to be distinguished in terms of the outputs of activity and who the users of that output are.

The implications for decision structures include the development of procedures to secure much greater involvement of clients in deciding what kinds of R&D should be done and the invention of techniques which better reflect the political character of educational R&D.

Adoption of the market model would lead to greater decentralization in the development of institutional capabilities for educational research and development. This would take the form of creating new specialized R&D institutions like the educational laboratories and the inculcation of a rich array of research activities in operating educational agencies—schools, colleges, universities, State educational agencies, even (particularly?) the U.S. Office of Education—designed to inform key decision-makers of many kinds about the adequacy of and progress toward stated objectives.

The implied needs for manpower development point squarely to training far greater numbers in development, operations research, and evaluation. The model also suggests the importance of devising ways to acquaint R&D personnel better of the requirements associated with different kinds of markets.

A concluding section of the paper identifies one vision of the general goal behind the integration of systematic inquiry and education and suggests what might characterize governance, research capabilities, organizational structures, linkage mechanisms, and manpower development if the goal were to be achieved.

EDUCATIONAL RESEARCH AND DEVELOPMENT IN THE UNITED STATES

EXAMINERS' REPORT AND QUESTIONS

[This document is circulated to Members of the Committee for Scientific and Technical Personnel for CONSIDERATION at the Confrontation Meeting of the Review of Educational Research and Development in the United States which will take place at the 24th Session of the Committee, 19th–21st November, 1969.

[It accompanies the background document "Educational Research and Development in the United States" [STP(69)9] prepared for the purpose of this Review by the Bureau of Research of the United States Office of Education.]

PREFACE

The Examiners' terms of reference were remitted to us by the Organisation in the following terms :

> " The examination will be concerned with the policies which govern the burgeoning educational R. and D. efforts in the United States. This is conceived to involve an examination of (1) the administrative and institutional mechanisms for educational R. and D., (2) the way that research in fields related to education is connected to particular innovations and to generalized developments in education, (3) the relationships between the priorities governing educational R. and D. activities and the major issues which today confront American education, and (4) the role of research in setting the framework for planning the long-term re-development of the nation's educational system."

In conducting the examination, we have relied on three main sources of evidence. First, we were able to see an early draft of the submission to be made to the OECD by the government of the United States of America (1). Secondly, we were able to consult many other written sources, some published, others taken from the files and records of the competent authorities and their advisory bodies. We have listed these sources in Annex B to this report. Thirdly, we held hearings with many of those most competent to advise us. They included federal, state and local school legislators and administrators, those concerned with university and teacher training administration and those concerned directly with educational research and development, including research students. In all, this constituted nearly eighty hearings and meetings with nearly a hundred people conducted for the most part by all four of us, but some conducted by one or two Examiners.

We visited the Boston and Cambridge areas, Syracuse, New York, New York City, Evanston and Chicago, Los Angeles, San Francisco, Palo Alto and, finally, held meetings in the capital city of the Union. Our programme of meetings, and those whom we met, are listed in Annex A to this report.

After drafting our report we had a further opportunity of consulting representatives of some of the agencies most concerned with the issues raised by the review. As a result of comments made by them, both in writing and at a meeting specially convened in Washington, we were able to strengthen and make our report more accurate. At the same time, we were

(1) "Educational Research and Development in the United States" [STP(69)9]. Factual data in this field are freely drawn from this document, giving specific chapter references.

able to take cognizance of some of the organisational developments that have taken place in Washington between the time of our visits in May 1969 and the date at which this report is submitted.

The creation of the programme of reading and visits depended on the empathetic and efficient work of Dr. Hendrik Gideonse, Director, Program Planning and Evaluation, Bureau of Research, U.S. Office of Education, and of the OECD Secretariat organising this exercise.

Dr. Gideonse occupies a role central to the matters reviewed but those knowledgeable with our field will see that in helping arrange a programme he ensured that the different interests were effectively and fairly balanced. To the Secretariat we owe not only our programme but also such sensitive and knowledgeable advice on the issues involved in the examination.

Finally, we express gratitude to the scores of distinguished Americans who gave time to meeting us, to providing information and facilities, including the help of highly efficient secretaries, and generally to making us welcome, if somewhat overworked, guests in their country.

We now offer our report for the Organisation's guidance in its confrontation with the government of the United States of America.

(signed) Paul Gérin-Lajoie
Kjell Eide
Maurice Kogan
Hans Löwbeer

CHAPTER I

INTRODUCTION

R. & D. as Part of the Educational and Governmental Structures

1. To examine research and development in American education is necessarily to examine the educational, governmental and social structure of which it forms part. Such fundamental issues as the ways in which the Presidency confers authority on, and requires accountability from, a multiplicity of agencies and the relations between the federal authorities and the States are the web and woof of our subject.

2. As far as possible, we have resisted the temptation to follow these issues of fundamental structure too far from our remit. Yet a second temptation was presented by the content of R.& D. programmes. At the present time, educational policy and structures are being intensely debated in the offices of the federal and state governments, on the campuses and in the mass media. On the eve of our first meeting, we saw demonstrations in Harvard Square and later arrived in New York to meet officials grappling with what has become over-simplified as the decentralisation issue. For three overcrowded weeks, we attended the bewilderments of the world's richest and most powerful nation facing some of its deepest domestic crises.

3. In this report we are concerned mainly with the ways in which the federal authorities are able to establish goals and priorities for educational R.& D. and how far organisation and institutional patterns are adequate to secure the achievement of these goals. We have not been able to make any adequate evaluation of the goals themselves or the individual research programmes devised to reach them. To have done so would have required time and resources not available to us. Moreover, many of the issues, as represented to us by witness, are of process and organisation as much as of content and product. Yet we must at the outset make clear the severity of the problems faced by education authorities at all levels. They have inadequate resources and systematic knowledge to cope with the rising expectations of their clientele and the deepening problems of the systems they administer.

4. That the problems are severe is exemplified by the following statement from the "Report of President Nixon's Task Force on Education", (published 1969) :

> "While not universally true, the failure of education in most of our larger cities is now so general and so great as to constitute one of the nation's most serious domestic problems. The reasons for this are not wholly understood but they include such factors as : a general shortage of funds in relation to the special problems faced by urban educational systems, the frequently inequitable distribution of state funds to the cities and, in some poorer and better-off neighborhoods; the influx to the cities of children with educational

deficiencies acquired elsewhere; massive inflexible and anachronistic bureaucracies for the administration of urban education that deny the possibility of a supportive community relationship to the schools; the difficult home conditions of urban children from poverty backgrounds; the irrelevancy of educational programs and curricula; poor teaching; and many others."

5. And the Task Force's generalisations might themselves be based on the more detailed arguments to be found in the Report of the Mayor's Advisory Panel on Decentralisation of the New York City Schools (submitted in 1967) :

> "The New York City school system, which once ranked at the summit of American public education, is caught in a spiral of decline.
> "The true measure of a structure of formal education is its effect on individual children. By this standard, the system of public education in New York City is failing, because vast numbers, if not the majority of the pupils, are not learning adequately."

6. It would no doubt be possible to find similarly disturbing accounts of educational problems as they affect American rural areas, and not only in the southern states, and the condition of higher and teacher education. It must be for others to establish the extent to which the R.& D. programmes are adequate to contribute to the solution of these issues. We hope that further and substantial review of them might be made so that those accountable for the R.& D. programmes will have a truer measure of the problems to be encountered by the systems which R.& D. are intended to help and better indicators of the extent to which programmes are, in fact, useful and relevant.

7. Having said this, we have had to resist the temptation to follow many issues which emerged surely enough as the substantive foci of the research and development entreprises with which we became acquainted. In this report, therefore, we try as astringently as reality will allow to discuss the processes of R.& D., their organisational positioning, and the balance to be kept between them and the other inputs, outputs and substances of the educational process.

Recent History

8. Our first conclusion is that American society has mounted an impressively large effort in educational Research and Development in a remarkably short period of time. Only, perhaps, in the U.S.A. would that effort be regarded as both trivially small and highly controversial. The principle that federal government might legitimately sponsor research and development of relevance to policy is quite new. It emerged first in the fields of health, defence and, more recently, aerospace. Such initiatives in education began substantially with the Co-operative Research Act, 1954, which became funded in 1957 as research programmes into handicaps. In the same year, the

curriculum support programmes of the National Science Foundation also began. This and subsequent legislation confer authority on the government to make grants which in the fiscal year 1968 amount to over \$170 million. The rapid growth of so large a federal intervention has created problems which are part of the substance of this report. But the American people deserve credit for willingness to go so far and so quickly. R.& D. not only helps them : American educational research and development ought to benefit education the world over.

9. Progress in the social services is rarely the result of rational determination. Unsystematic genesis might, indeed, be not only inevitable but also no bad way for progress to be made. Early mistakes can benefit later efforts. Creativity can get ahead of resource control and codification. At its best, this is what has happened in the U.S.A.

10. The increase in federal funding of educational R.& D. has been dramatic, but the total programme has been as much the product of pressures within and outside Washington as the result of goal definition and pursuit. The earliest initiatives derived from concern about preparation of the brightest children. More recently, compassion for and fear of the consequences of poverty are the main motives. Handicapped children, high school physics and other curriculum initiatives resulting from the reaction to Sputnik, early childhood, disadvantage, and now, most recently, experimental schools - (to the tune of \$25 m.) - there is no clear pattern in all this. Some sponsors are, indeed, quite clear about their aims - the National Science Foundation's programmes referred to in paragraph 8 above are urged upon us as an example. In the 1950s the single largest source of R.& D. funds and ideas were the private Foundations. They still are the point to which many adventurous plans are directed or from which initiatives come. If they resist successfully some current Congressional attempts to reduce their impact, they will continue to help initiate and test innovation and change. Since then, initiatives have been taken by the leading Schools of Education, by Congressmen, by the Presidency, by the scholarly élite who constitute a new educational establishment to establish publicly funded programmes. All of these pressure groups now converge on the federal decision-makers.

11. The main issue is now whether divisive authority and power structures, comprehending as they must the different time scales of political decision and scholarly effort, are adequate as frameworks for national decision-making in the future. Now might be the time to take stock; to establish goals; and, with the goals, a work performing structure within which constraints are explicit and predictable, discretion wide, beneficial pluralism and debate possible and within which further development might take place.

12. One thing is clear. The trend in R.& D. development is irreversible. While in years of financial stringency further advances might be resisted, a power structure is already built around the R.& D. effort. As of 1964, there was already an educational research community consisting of over 4,000 (full-time equivalent) practitioners and perhaps double that number of actual participants. They are conscious of and are helping to create the political world in which they have to move. And the R.& D. programmes have led not simply to more R.& D. but to institutional growth and readjustment. They have established new federal and Office of Education roles. They have created new research and development institutions which seek to bridge the gaps between scholarship and the needs of the school. They might also have stimulated new attitudes and expectations both within the school community itself and among others interested in its work. As viewed from outside, a second historic phase might well be about to begin.

13. We conclude this introduction by briefly summarising the R.& D. effort as it is evident in the U.S.A.

The educational research and development effort in the United States is large and relatively new. A conservative estimate developed by the American authorities puts the total expenditure in this area at $250 million for Fiscal Year 1968. While support from federal sources for research and development efforts specifically targeted on educational problems dates only from 1957, a great jump in funds occurred between 1965 and 1967. Appropriations available to the United States Office of Education, the National Science Foundation and the Office of Economic Opportunity increased during that period from a total of $51.3 million to over $128 million. By FY 1968, funds from federal sources directed to education or related research totalled $171 million.

The funds available are expended by a broad range of institutions. Colleges and universities are the largest single group of performers receiving approximately half of the dollars in FY 1968. Research and Development Centers of many kinds (but generally university-based) spent more than $16 million. The new (1966) Regional Educational Laboratories accounted for $23 million in FY 1968. Profit and non-profit institutions, state and local education agencies, and the Educational Resources Information Center accounted for the balance of the expenditures. A major recent study of research and development manpower estimated the number of personnel engaged in this field in the United States at 4,125 in 1964. The number has more than doubled since then with the dramatic increase in expenditures. The fifteen Educational Laboratories alone, for example, now employ over 800 full-time professionals.

The analysis of the R. & D. effort reported by the American authorities reveals that the allocation of support to research is about the same as that to development and both together account for by far the largest portion of the total R. & D. effort. The largest single topic of concern for R. & D. activities in the United States is curriculum, instruction, and directly related activities. Research on learning processes is the next largest category. Relatively small amounts are allocated to research on social influences in relation to learning. Heaviest concentrations of support are to be found on R. & D. directed to early childhood and elementary and secondary education generally. About twenty percent of the documented base effort in FY 1968 was directed toward R. & D. focused on the socio-economically disadvantaged target groups; ten percent of the base was devoted to research and development concerned with the educational needs of handicapped children and youth. These major concentrations were supplemented and complemented by research of almost every conceivable kind and devoted to virtually all topics directly and indirectly related to learning, instruction, and education.

CHAPTER II

THE NATURE OF R. & D. AS PART OF THE EDUCATIONAL PROCESS

14. Several models of R. & D. as part of the educational process have been discussed with us. The main types are well described in the Office of Education document (see Chapter I) and we need not discuss details here. Before, however, we briefly consider the models accepted in the U.S.A., and their efficacy, we comment on the case that has been made for R. & D.

The Case for Educational R. & D.

15. Although within the political power structure[1] knowledge of and support for educational R. & D. in the U.S.A. are weak, and opposition to certain aspects of existing programmes is formidable, we have found none who believes, or who is prepared to state, that it is unnecessary. One distinguished educator has put the case well: "Because education has lacked strong and closely linked communities for the production, transmission, and utilisation of knowledge relevant to its functions and objectives, it has found it difficult to respond to the increased demands made upon it as a result of rapid transformations in culture and society." ...."the most dynamic and effective operations in our society rely heavily on continuing inputs of knowledge relevant to the enterprise and the speedy application of new knowledge to the solution of problems and the attainment of objectives. A corollary is that occupations and enterprises that operate from a weak knowledge base, or which falter in their efforts to adapt knowledge and technology to their special requirements, operate at a serious disadvantage. Few can doubt that education is in this category." Dr. Chase's statement [2] summarises the claims made for R. & D. by the research community. The case for educational R. & D. is, indeed, more intuitive than provable: a point difficult to make candidly in the political environment. Yet examples of policies and practices defined by research and development effort are not difficult to discover. The use of psychometrics in educational decisions about individuals, through educational testing, is an example. The current emphasis in federal and other policies on help for the disadvantaged, and on the problems of early childhood, must derive from political decisions on priorities but is substantiated by research findings on the relationship between socio-economic class and educational performance, and on the importance of early educational experience. The present task of much R. & D. in these areas is to identify ways in which educational processes can reverse the effects of deprivation. Again, issues of government and administration of education have hardly yet been systematically studied but who can doubt that the few systematic enquiries in this field, as the Bundy Report on

(1) This is a judgement based on some of our discussions with witnesses. It has, however, been pointed out that public opinion more generally supports such products of educational development as the new mathematics and science curricula. It remains suspicious, however, of educational technology. (Harris Poll published in Life, 16th May, 1969, page 34.)

(2) Journal of Research and Development in Education, Summer 1968, pages 3-4. (Note the existence of a journal specially devoted to educational research and development.)

New York, or the Passow Report on Washington D.C., at least help to identify problems?

16. The case for educational R. & D. is as difficult to make as that of other social sciences in their infancy. It tackles problems for which there is as yet hardly a descriptive vocabulary. The case must rely primarily on the intuition that an enterprise using 56.4 billion dollars a year in 1967/1968 and forming the main occupation of 30% of the American population must have time and resources with which to examine itself and to specify and promote its own development. It must have been for these reasons that President Nixon's Task Force did not even stop to argue the case but merely referred "to the extremely serious, possibly even dangerous, situation created by the drastic reduction in the rate of increase of federal funding of university research, especially scientific research." They went on to say that,"We believe that the federal government has a special responsibility for the support of research in education and dissemination of findings; for systematic evaluation of the quality of education offered the American people; for the support of educational experiments; and for the promotion of desirable change in the educational system". In their opinion "the federal government has been engaged in each of these activities except systematic evaluation of the quality of education and has in our opinion achieved sufficient success to warrant greater efforts".

The R. & D. Process - Models

17. Chapter I of the Office of Education Report discusses the main models of and dimensions of R. & D. We do not repeat them here. In summary, one type of model is describable as a linear or a dependency model while other models are multi-dimensional. The first type assumes that there is an activity which might be called fundamental research which leads to development, which leads to dissemination of results and which leads to innovation and installation in the schools. It is essentially a production line model and contains potential differentiation between Thinking and Doing, researcher and teacher. Stated baldly thus, it enables tasks in the R. & D. sequence to be allocated institutionally and for specific purposes and roles to be distributed.

18. A second type of model would be multi-dimensional. It assumes that fundamental research feeds on the operational experiences encountered in the phases of development, dissemination, installation and innovation. These, too, feed on the results of fundamental research. It holds an eclectic view of the process which can accommodate many pioneers of theory such as Froebel, Piaget, Dewey, whose primary sources of data were the children with whom they worked in classrooms. They assumed that innovation might begin with teachers in the classroom and become, by empirical-inductive, rather than by theoretical-deductive process, the seed bed of fundamental research. A third model emphasises differentiation between the different phases but allows for inter-relationships as policy requires.

U.S. Preferences

19. We must observe from answers given in our many interviews and our survey of the literature that in American R & D the simple, and linear, model often predominates. Educational services are thought of as products which, like other products, can be determined conceptually, specified, developed and delivered in the form of defined teaching-learning processes. Such models can indeed be defended. For example, operant conditioning can certainly affect the operational efficiency of children in the classroom. The vast resources embodied in text-book creation, and its younger and more sophisticated versions - in the method-material systems - are, at their best, prime examples of the linear style process. This style - the behavioural engineering style - has been developed to high levels of sophistication in the most mission oriented federal agency - the Department of Defence. It has the massive advantage of meeting comfortably the criteria set down by such recently developed management tools as operations analysis, systems analysis, cost-effectiveness and so on. If there are doubts about it they do not stem from administrative criteria but from anxiety that the process of educational improvement itself is not best described in linear terms.

20. Linear models can ignore the fact that good styles of education have been created - in the U.S.A. and elsewhere - by teachers who, believing that children are the best agents of their own learning, provide an environment in which children's own interests can act as a motive force for the learning sequences prepared and conditioned by the teachers. There is a risk, too, that the linear models assume that teachers(1) are the recipients rather than the agents of research and innovation and can ignore the belief that "educational practices provide both the problems for educational enquiry and the 'field' for testing and shaping conclusions". A linear model enables both an institutional and a conceptual hierarchy to be created because teachers' experiences - which might in the U.S.A. become experiment with observation of 30 million students and pupils - are implicitly discounted in favour of concepts developed away from the classroom laboratory.

21. Children's learning seems to become the object of a priori reasoning rather than the centre of observation. Wherever originated, the most important changes must be implemented by teachers and their students. Other dangers can be observed - the premium placed on the replicable, the quantifiable, the stability of situation needed for control in experiment, which have become the constipating curse of much of social science.

22. The R. & D. programmes financed from federal and other sources have not related explicitly to any of the models or patterns discussed in paragraphs 17-20. Such models are largely ex post facto creations. Policies derive instead from judgements of what the schools are producing. Some assume (we quote) that "the Schools of Education are terrible" and that "a small number of people are ruining our children". Such

(1) It is, of course, possible to state linear models which start with observation of children but take insufficient account of fundamental research. Also, while we comment here on what seems to be the predominant style, we have been reminded that some programmes, such as those promoted by the N.S.F. involve teachers in much the way that is implied in paragraph 20.

critics have not simply criticised: the National Science Foundation and the Physical Sciences Studies Committee programmes owe their origin to a positive belief that curriculum ought first to respond to the subject matter with which it is concerned, that the creation of excellence through the intervention of scholars in curriculum development and dissemination can promote progress in the curriculum and in the schools not directly participating in the programmes.

The Nature of the Process

23. Our own views lean towards the more complex models though we do not wish to express an opinion as between them. We share Dr. Chase's view of these processes. He writes that "research and development may be thought of primarily as a set of interrelated processes for dealing with problems in the context of the systems of situations in which they arise. It leads to the modification of existing systems for more effective performance and/or construction of new sub-systems for performance of specified functions ... Simultaneous processes of research and invention are employed .... to increase the working capital of applicable knowledge and technology. The research, therefore, is development-relevant or motivated whether it is used to improve understanding of phenomena, to contribute to the solution of identified problems, or to test the effects of operations. The development in turn is research-informed, or guided, though not research-limited. Research is essential to systematic continuing of the knowledge base on which development rests; and development constantly poses new problems which require research. At its best development often outmarches research by imaginative theoretical constructions and inventions; but as it does so, it gives new impetus to research and counts on the latter to regulate the pace for the health of the system, societies and individuals concerned."

24. Here we have a description which enables us to contemplate the R. & D. process as a complex of processes in which there is no natural hierarchy but rather - to follow the fashion - a helical relationship between the main components. To regard it thus is not to restrict opportunity for participation, but to increase it. It makes it the more necessary, however, to specify the roles of those who research, develop, disseminate, innovate, install and teach. It is difficult but not impossible to define the R. & D. process. It is more difficult to understand what will make the processes useful, and the administrative structures and relationships with the scholarly community that might result.

25. Finally, we share the view of one of our witnesses that in considering R. & D. "the definitional problem is grotesque". Does it include the biochemistry of the brain, the effect of peri-natal conditions upon later educational performance, the techniques of producing audio-visual aids which ham-fisted teachers might use? Where does it begin and end? To state the question is to answer it. The problem is not to find good work

for educational R. & D. to perform, but to establish priorities in a field where potentially nothing is wasted.

Some Issues

26. At this point, therefore, before entering on a more substantive discussion of the present R.& D. structure, we express doubts, in question form, about what we have observed:

(a) How far does the multi-dimensional concept of R. & D. hold in the U.S.A.? Is there connection between the teachers as agents of change and the scholarly community as providers of fundamental research and development? Our witnesses believe that educational R. & D. has, hitherto, had little effect on the classrooms. Perhaps classrooms, too, have had little effect on current research.

(b) Is there, perhaps, an assumption that change in itself is good and that emphasis must be put, through the political machinery, on innovation ("get rich quick" research) rather than on careful development based on observation of needs or even the clear formulation of assumed needs?

(c) Is there a premium placed on quantifiable and replicable research irrespective of whether these serve as constraints upon desirable development - creative leaps restrained by tape measures?

(d) Is there a tendency to back theories and movements now in vogue, such as operant conditioning and technological aids to education, at the expense of more eclectic programmes?

(e) Is there a tendency to favour "teacher proof" curricula and curricula related to the inculcation of measurable skills (partly, perhaps, as a reaction to crises in city schooling)?

(f) Are processes of R. & D. sharply enough directed to all of the obvious and large problems? Why did we hear of not one federally supported pilot experiment in student participation, for example?

(g) How far are the processes of R. & D. leading as they must to innovation and, (if the word must be used), installation in the classroom related to teacher training, both initial and in-service? Is there any concept of who the change agent may be?

27. In our questions in paragraph 26 we indicate some areas of potential anxiety about the R. & D. process as it is conceived in the U.S.A. at present. We put the questions sharply because we believe that the place of R. & D. in the American education system is secure. We share the views of the vast majority of our American witnesses that the effort ought to be increased. We believe, too, that it needs to be more clearly delineated and improved.

CHAPTER III

R. & D. GOALS AND OBJECTIVES

28. We start with the assumption that research and development goals or objectives are conterminous with those of the overall educational activity. The differentiation between R. & D. and other educational activities occurs at the point where goals or objectives are translated into tasks or the performance of work leading to the fulfilment of goals or objectives. One witness offered us a definition of R. & D. goals which supported this assumption: "the continuous improvement of education".

29. The determination of R. & D. goals therefore depends upon the determination of educational goals. And here we share Professor Bloom's view that "there is little doubt that the problem areas selected for R. & D. work were important areas for education. However, there are so many important problems in education that it would be difficult to go wrong on this."

30. Only in one place (see paragraph 32) in the official literature is there an explicit statement, let alone discussion, of goals. And this statement is of fairly recent origin. The role structure and the allocation of tasks to different roles thus developed without clear relationships to objectives. The goals of the educational system are seen in such terms as "equality and quality". But such statements are so acceptable, because obvious, that they provide no defined boundaries within which tasks can be meaningfully performed. We have also been told that the creation of educational goals is the result of a "highly pluralistic, and sometimes anarchic pattern of development". "There is no such thing as U.S. national policy." Or, again, the President's Task Force writes "despite the magnitude of the federal role in education, there is at present considerable ambiguity in it." It attributes the present federal responsibility for education to "the General Welfare clause of the Constitution. It consists of an obligation to provide leadership and financial support for certain specifically defined areas where, because of population mobility, the dictates of national security, the need to promote equal opportunity, or other special reasons, a national concern for the public interest, or 'general welfare' transcends the sum total of the collective concerns of state, local and private agencies.

"Examples of areas falling by this definition within the federal purview (of course, not exclusively so) are: education of the disadvantaged (including the handicapped), the training of teachers and educational administrators, urban education, curriculum reform, vocational education, medical education, and, research (including basic research on learning, appraisal of the quality of education, experimentation and dissemination of research findings)."

31. This seems to us to summarise accurately the present preoccupations of much of federal policy making which also seems to us, as outsiders, to correspond well to many of the prime needs of American society. And, more directly on our theme, research and development programmes relate to many, if not all, of the main areas of federal intervention and support in education. There are notable exclusions: teacher student relationships, the government (or governance) of education have become prominent issues within the last year but have not yet been explicitly delineated as areas of federal policy or research. Furthermore, the stated fields of work are not always defined meaningfully in terms of objectives. Concepts such as "quality" or "improvement" require interpretation, if R. & D. directed towards their achievement is not to meander meaninglessly along paths created by fashion or the individual intuitions of researchers or promoters. In terms of research policy, these may be the key questions.

32. The present goals of R. & D. can thus be discerned by inference rather than from explicit statemente. There are no clear mechanisms by which educational goals are defined. There are differences in their definition according to the etandpoint of the definer.

33. It might be reasonably asked whether it matters that goals are imprecise. The imprecision is confirmed by every witness to whom we have put the question. It is felt to be so by the members of the academic community, by senior people within the school systems, and by the President's Task Force, and by officials in the Office of Education and in other Government agencies. "The federal effort has .... in recent years been characterised by a multiplicity of unco-ordinated, and sometimes conflicting, initiatives from many different departments and agencies of the executive branch of the Congress .... There has .... been a serious lack of coherent planning and co-ordination within the government and absence of any mechanism for centralised appraisal of the net effect of the myriad federal initiatives of state and local education authorities and of education institutions." Thus the President's Task Force. These defects stem in part from lack of administrative coherence and in part from the incapacity of the system to define goals in a rational way. Indeed, the whole initiative of the federal authorities since 1954 is best described as a stream of politically created initiatives in which well meaning and highly motivated pressure groups have succeeded in getting good achieved, bit by bit rather than as part of a formulated plan.

34. Planning of the national R. & D. effort has, however, become more apparent in recent years - witnesses say in the last two or three years. A recent document prepared by the Bureau of Research and the Research Advisory Council of the Office of Education has attempted to state the goals for the Bureau of Research for use in the next planning cycle of five

years to begin in Spring 1969. In this document, the goal of the research, development and other research related programmes of the Bureau is stated to be "the continuous improvement of instruction and the educational processes". Instruction is thought to encompass both teaching and learning and the institutions designed to sponsor both. And it extends "the educational process" to those influenced outside the teaching-learning encounters themselves. "The goal of continuous improvement subsumes pursuit of the continuing renewal of American education on the basis of research-based practice and disciplined enquiry." The document goes on to list seven major substantive priority areas as follows:

- urban education
- vocational, technical and occupational education;
- equality of educational opportunity;
- early learning;
- general education;
- professional and continuing education;
- finance and organisation of education.

35 The priority areas are then translated into five principal missions expressing functional priorities. The first is, briefly, the creation of materials and mechanisms by which substantial and measurable improvements in education can be secured. The second is the production of knowledge required for the continuous improvement of materials, practices and environments. The third is to promote the spread and dissemination of knowledge about instruction and educational process. The fourth is to expand and/or build the individual and institutional capabilities necessary for carrying out the three missions previously specified. The fifth is the demonstration of research-based practices, materials, organisations and environments.

36. In our view, the document represents a serious attempt to review the main areas from which priorities can be selected. It is not the fault of the authors if it is already, as implied in paragraph 31 above, somewhat out of date. In a dynamic service, goal definition is continuous. The important point is that the Office, after fourteen years of enabling legislation, and fourteen years of experience of supporting a wide array of R. & D. projects, has now reached the point where it sees the expression of goals as possible and desirable. The document itself recognised that it was necessary to move beyond the identification of priority areas and the statement of functional missions to the explicit identification of the R. & D. objectives to which priority areas related. These would then constitute the bases for detailed R. & D. planning and programming. The effectiveness of the selection remains to be questioned as does the sense of priorities which ought to make for effective selection.

37 We end this Chapter with questions which remain to be answered:

(a) Given so broadly distributed a decision-making structure, so heterogeneous a society and so divided an academic world, can goals be clarified and enunciated to become operationally useful?

(b) Can some of the narrowness of research criteria (referred to in the earlier paragraphs and in the U.S. Offices Goal and Priority Statement itself) which result from the lack of clarity of goals be removed?

(c) Are the statements of goals and objectives sufficiently defined in terms of values to escape value loading in judgement of research and development performance? As they stand are they statements of general areas of concern rather than meaningful goal formulations? If so, how can fundamental policies be formulated?

(d) Is the emphasis in R. & D. on performance in traditional subjects (reading, writing and arithmetic) based on well established theories on their relationship with basic educational aims or does it merely reflect a minimally acceptable consensus of what education must "produce"?

CHAPTER IV

THE DECISION-MAKING STRUCTURES - AUTHORITY, POWER AND CONFLICTS

38. We described in the previous chapter how machinery by which goals for educational R. & D. is only now being established, with results not as yet completely successful. We have also alluded to the divisiveness of the decision-making structure which has to create goals and implement them through work performing role structures. Our witnesses - all well informed and deeply involved in these issues - were uncertain and inconsistent among themselves about the locus and mode of national decision-making.

39. In part, the problems facing the organisation of educational R. & D. are the faults, and the strengths, of the whole U.S. political and administrative structure. One model of government - not itself able to guarantee success - emphasises that governments, once elected, have authority to propose policy, pass it into law, require funding of it, and implement policy. Government is thus endowed with authority to do work and find resources for that work, by virtue of its election. It holds its authority subject to the due processes established by fundamental constitutions, written or otherwise, which ensure that it keeps within law and that it does not exercise legal authority improperly. And, ultimately, and regularly, it displays its accountability to those who elect it by seeking re-election.

40. The American system follows this unitary pattern only in part. The executive and legislature work together in such a way as to emphasise "checks and balances". This is a hard fact for those who have to get on with the tasks created by legislation, and by the exigencies of society's needs.

41. In the U.S.A. administrative disjunctiveness is both rampant and deliberate (1). The authority structure, that is to say, the structure of roles created by the President and

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(1) This judgement derives from our own observation, meetings with witnesses, and from such documents as the Report of the President's Task Force, quoted earlier. It has been put even more sharply in a recent study*(1967) containing studies of poverty and community action in the United States:

"No other nation organizes its government as incoherently as the United States. In the management of its home affairs, its potential resources are greater, and its use of them more inhibited than anywhere else in the world. Its policies are set to run a legislative obstacle race that leaves most reforms sprawling helplessly in a scrum of competing interests. Those which limp into law may then collapse exhausted, too enfeebled to struggle through the administrative tangle which now con-

* Marris & Rein "Dilemmas of Social Reform", Routledge and Kegan Paul, 1967.

his subordinates to ensure the carrying out of work or tasks, is surrounded by tough and exuberant power structures of which the strongest converge in the Congress and its committee structures. The Congress has power to impose its own criteria, such as they are, and its own time scales, upon what the executive thinks need be done. A President elected by popular vote to do work can thus be hamstrung by a Congress elected by the people to ensure that the work is not done at too much expense or in the face of too many of their beliefs and prejudices. In such an environment, R. & D. proponents feel it necessary to create expectations higher than they can satisfy. Congress is "benefit orientated" and prefers to sanction what it can see, weigh or feel.

42. The chart below (Fig. 1) displays the lines of authority, from the President downwards, which are accountable for the commissioning and performance of educational research and development.

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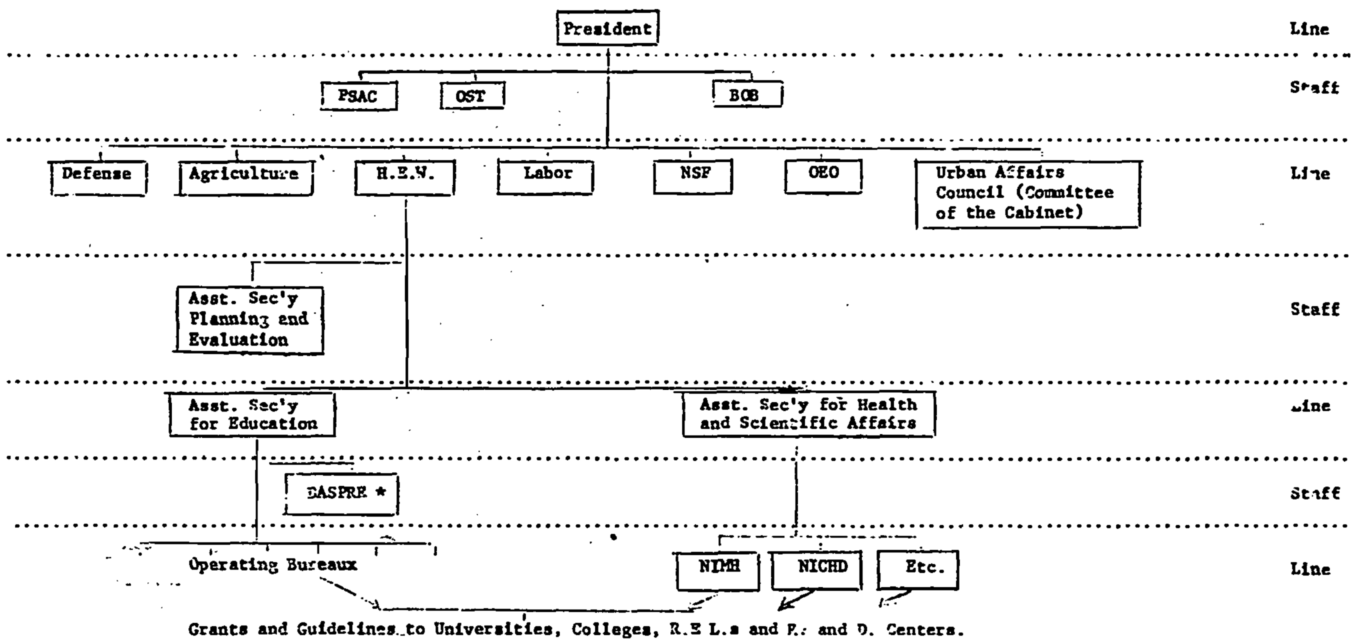
fronts them, and too damaged to attack the problems for which they were designed. This humiliation of the will of government is popularly reckoned no bad thing. Both the abundance of resources, and the hamstringing of their exploitation, express alike the triumph of democracy."

And later:

"The same pattern of fragmented authority confuses the administrative structure. 'There are altogether over eighty different government departments and agencies which report direct to the President of the United States. They are not grouped in any hierarchy which would permit the President to restrict his dealings to a smaller number of intermediaries who would make reports and carry back the Government's decisions to the agency chiefs. Each of them has the right of access to the man at the top and is determined to use it. It is almost inconceivable that a coherent policy could emerge out of an administrative welter of this kind. Its effect under any but the strongest President is to turn the offices of the Government into a loose confederation of more or less hostile bodies competing with one another for more money and more power.' * In local administration, the rivalries are as fierce, and autonomy even less domitable, since agencies answer to different governments, or to none at all."

*Andrew Shonfield, "Modern Capitalism", (Oxford University Press, 1965), p. 319.

Figure 1. MAIN LINES OF AUTHORITY IN EDUCATIONAL R.& D. POLICIES



* Deputy Assistant Secretary for Planning, Research and Evaluation.

43. The diagram can be read as follows. The President appoints a Secretary for Health, Education and Welfare and holds him accountable for federal educational policies and administration of those particular educational programmes assigned to HEW. The Secretary, in turn, holds the Commissioner for Education (who is, however, appointed directly by the President) accountable to him for the creation of policies and for carrying them out. The Commissioner (who is also an assistant secretary) has subordinates at the Associate Commissioner level heading operating bureaux such as the Bureau of Research. The President himself is subject to censure or commendation, support or obstruction, by the Congress, and to the people at large at election time who can dismiss, or elect him. (To complicate our picture somewhat, we should point out that what was the "line" Bureau of Research when we conducted our visits and, therefore, an "operating bureau" has since become the National Center for Educational Research and Development which is, as a constituent agency under the DASPRE, a staff role to the Commissioner. This rearrangement should be kept in mind when considering our discussion of the Bureau of Research.)

44. This constitutes the "line" or executive organisation. Even in classic formal organisation as stated here, the "real" authority pattern might deviate greatly from the theoretical structure. The U.S. system starts with this theoretical structure, which generally exists in other countries as well, but the system, and the power structure which surrounds it, seems to operate in several important ways so as to deviate from the theory.

45. First, while the President and the Congress confer authority on the Secretary and on the Assistant Secretary, both of these highly responsible and senior roles are concerned with educational R. & D. in such a way that they share authority and perform tasks in parallel with other agents of the Presidency. Some of the "line" agencies are headed by Cabinet officers - the Secretaries for Defense, Labor, Housing and Urban Development and for Agriculture. All of these participate in educational research and development policies and have direct dealings with the main instruments - universities, colleges, regional educational laboratories and R. & D. centers - which are concerned with educational R. & D.

46. Other "line" agencies such as the National Science Foundation and the Office of Economic Opportunity have direct access to the President but are not in the Cabinet. They, too, dispose of educational research and development funds, and take part in decisions on their disposal. If, for the present, one considers simply the line organisation of Washington, one sees, therefore, that there are two points of convergence only within the whole system. The first is in the large number of R.& D. institutions in any one of which might converge the grants and guidelines of several federal line agencies. The second is the President himself and his immediate staff.

47. As with any but the most simple and elementary organisational structures, the "line" organisation is reinforced by "staff" structures. The definitions of "staff" are numerous and we take it as common ground that staff agencies are concerned with advising those who make decisions on specialist aspects of the decision-makers' work. Staff officers help create policies, and help enunciate them to those in line with the manager who is common both to the line and the staff subordinates.

48. The diagram shows that the President is advised, from a staff position, by the Bureau of the Budget, and by the President's Scientific Advisory Committee and by the Office of Science and Technology. Neither of these are line decision-making bodies but advise those who make decisions. And as one looks lower down Figure 1, it is possible to see staff roles within HEW. The Assistant Secretary for Education has, as a staff colleague, an Assistant Secretary for Planning and Evaluation who is accountable to the Secretary for Health, Education and Welfare for staff advice on the whole range of his responsibilities. The Assistant Secretary for Education himself has a Deputy Assistant Secretary for Planning, Research and Evaluation who, too, is shown as being in staff relationship with the Assistant Secretary and with the Assistant Secretary's subordinates in the operating bureaux.

49. On the extremely brief acquaintance that the Examiners have had with the authority structure of Washington, it is hazardous for us to make judgements. But there are interesting characteristics which might be observed in the structure and which we know are at present being considered and worked on by the officials concerned. The first point is that there is a curious reversal here of the usual position of staff officers. It is not easy for those in a staff role to be certain of their authority to make recommendations and, if it is that kind of staff role, to ensure that the different line structures are aware of, and work within, the manager's policies. In Washington, there seems to be some reversal. The organisation chart resembles a Christmas tree in which the main authority lines represent the trunk and the staff lines emerge as branches. The authority adhering to the staff roles seems to be stronger, and all the stronger because not clearly specified, than is requisite in a structure which must produce decisions and get its work done. Moreover, while the relationship between staff roles and operational roles at any one level of the hierarchy might become better specified (and in recent months there appears to have been a great deal of hard work put into this) there still remains an issue concerning the relationship between the different <u>staff</u> roles. Thus, we see the President advised by the Bureau of the Budget on programme effectiveness, budgetary control and legislative and administrative co-ordination. He is also advised on one extremely important aspect of educational R.& D. policy - science and technology (but to view the chart pedantically, on no other aspect of R.& D. at least at this level) - but then at the two tiers below - departmental and Office of Education level - there are, again, extremely power-

ful staff roles. It may well be that the issues are so complex that this amount of "staffness" is necessary and important. It is not clear, however, to outside examiners, on admittedly superficial evidence, how this enormous weight of staff advice and control converges meaningfully upon the officials who have to do the work in the operating bureaux.

50. Arguments for non-monolithic structures, in which policies are constantly reviewed and major issues continuously argued, are easy to respect. For example, it could be argued that the present line agencies have not done a good job in creating R.& D. programmes. We ourselves have criticised the linear dependency and systems engineering flavour of the programmes (see Chapter II). This being so, the system ought to be open so that beneficial conflict and fruitful friction can take place. Again, social service and science policy deal with enormously complex issues and it would be naive to assume that departmental line ought to be sacred. Sometimes, perhaps often, they need to be crossed or even ignored. It is obvious, for example, that the Office of Economic Opportunity must work in the areas of housing, health, social security and education and therefore interest itself in the operational work in many departments. And those accountable for advising the President on scientific policy would be negligent if they did not take a lively interest (and they do just that) in the development of educational R.& D. But the very complexity of the task argues less for administrative diffusiveness than for extremely sophisticated and well specified systems in which inter-departmental and inter-bureau "collaterality" is achieved and in which the always sensitive relationship between staff and line roles is made explicit, specific and useful. The different subordinates of one manager, in this case ultimately the President, each have their work to do, must accommodate with each other, and have a common superior to resolve difficulties. When we first made our review, this sense of collaterality was not clearly evident in the macro organisation of Washington. And new agencies set up to deal with emergency issues were, naturally enough, concerned with getting on with their job more than with worrying about how existing agencies in a similar or contingent area of work might be allowed to get on with theirs. The speed and enterprise of American government did not seem to us to be matched by organisational specificity.

51. Our concern here is not to ride theoretical hobby-horses but to emphasise that educational R.& D. has to justify its place in a political environment where resources are strongly competed for and where public enterprise is always viewed critically or even suspiciously. If administration is to be open, flexible and creative, it must have the confidence that comes from support between colleagues engaged collaboratively in similar enterprises. And it is pleasant to record that in the few months between making our review and the drafting of this report, structural reviews and working together between different agencies to these ends have become apparent.

52. Brief mention ought to be made here of the role of the Bureau of the Budget. No Bureau of the Budget, or Treasury, or Ministry of Finance can do right in the eyes of those claiming funds. They all have the bracing, if unpopular, task of reconstructing one form of reality, that perceived by those who must meet the real world of education or whatever, with the reality of the tax raisers and of the men of good financial common sense. Obviously, the intensity of Bureau control varies with the importance, the novelty and the quality of administration of programmes subjected to its review. What cannot be easily discerned is a sense that the Bureau's staff role is really regarded as such. The Bureau comments not only on the general size of the R.& D. effort and on its disposition between the agencies, but also is able to tackle departmental budgets by the line and so exercise the preference of budget controllers on educational R.& D. programmes. If the Bureau of the Budget can, in effect, convince the President that the Department of Health, Education and Welfare is inaccurate in its presentation, then they are the de facto cross-over point rather than the budgetary staff agency to a Presidency. Debate between the budget staff officers and the educational policy-makers is obviously right and proper. It is the danger of "second guessing" which cannot be corrected that needs to be guarded against.

53. These problems are evidence of progressive policies working within developing organisational patterns. Yet the problems do not end outside the doors of the Department of Health, Education and Welfare. The same sense of administrative divisiveness seems prevalent inside. We discuss these problems which have, however, been tackled in the few months between our visit and our submission of this report, in Chapter V below.

Working within the Power Structure

54. The total administration, from the President downwards, is subject to the initiatives and dispositions of the Congress. The Commissioner for Education is required to seek annual appropriations which are determined by, first the President (with, of course, the advice of the Bureau of the Budget), and then the Appropriations Sub-Committees of the Senate and of the House of Representatives.

55. Any educational proposal considered by the Congress or the administration will be subject to the waves of public opinion created by large power structures. We were impressed by the keen interest felt and expressed by many distinctive groups whose influence on policies is great.

56. The first group with which the Office of Education must come to terms has been called "the old educational establishment". This is primarily the network of state and local school district authorities who are ultimately the recipients of and respondents to R.& D. developments. Their own role in this field has been modest but there is increasing pressure on the

federal authorities both to fund local initiatives and give their representatives a larger place in the consultative machinery. They have close ties with the teachers' professional bodies and they frequently have close working relations with the Schools and Colleges of Education, particularly the state-owned university institutions. A second power group is that of the discipline-based scientists who have been directly responsible for some of the initiatives in R.& D., particularly in curriculum development. In only a few cases are these experts associated with the Schools of Education. They tend to stand somewhat aloof but with access to the decision-making structure both through the normal consultative channels set up by the Office of Education and the National Science Foundation, and through the non-line agencies such as the Office of Science and Technology, or through the President's Science Advisory Committee. These bodies have a declared and active interest in matters clearly within the field of educational R.& D. They have a place in Washington decision-making and make enquiries into educational matters which have considerable influence. Thirdly, there is a "new educational establishment". This consists of the more prestigious educational statesmen who tend to connect with the leading private universities, such bodies as the National Academy of Education, the President's Task Force, ad hoc Commissions such as the Bundy Commission on decentralisation in New York, and in the private Foundations. They represent a powerful connection between the intelligentsia, the more traditional academic world and the world of the liberal philanthrapoids, including the more development-minded large business and industrial organisations. They overlap, of course, with the second group.

57. Within the last few years, there have been substantial shifts in the power relationships of the different blocks. Thus, the Schools of Education have yielded some of their influence within the school systems to the representatives of the new establishment. Also, the creation of new institutions - the regional education laboratories and the educational research centers - have become powerful competitors to the more traditional university R.& D. bases.

58. Other forces in the power structure such as, for example, the American Education Research Association, stand between the more traditional university structures and the new educational establishment. They, too, are taking cognizance of the changing relationships between the centre and the R.& D. institutions and are formulating distinctive views on behalf of the new educational R.& D. profession.

59. In describing the power structure, we must be wary of representing conflict as if it were always harmful. The old establishment have legitimate interests to defend. If the schools are educational laboratories for experiment and development, they are also primarily concerned with on-going processes, which take precedence over change and innovation. The Schools of Education have led the demands for federal funding of R.& D. - a few Deans stand out in this - but cannot be other

than careful in their approach to the new institutions upon which the government are placing so much reliance. The "new" academic establishment, with which are associated the subject-based specialists, believe that the schools need radical treatment and, on this assumption, cannot be too charitable towards existing institutions and R.& D. patterns.

60. The interests are all legitimate and they all press their case with ardour, and candour. But there must come a point where repeated debate becomes wasteful of energy and where decisions have to be taken. And the relatively sophisticated, if sharp, debates within the educational power system all have to contend with the residual opposition of the American tax-payer to spend money on things which he does not understand. No official we have met feels it inappropriate that Congress should exercise vigilance, but some believe that if Congress is to exercise detailed control, it should do so on better information.

61. As we see it, the Office of Education and its Bureau of Research (now the National Center for Educational Research and Development, and in staff position) are held accountable for policies over which their authority is disputed. The main characteristics of these interlocking structures - of authority stemming from the Presidency, of the power structures surrounding the Congress, and of the divisions within the President's authority structure - might be beneficial to a variety of ideas but must, if unconstrained, affect the efficacy of the federal effort in R.& D. for the reasons discussed in paras 63 to 65 below.

Results

62. We report the judgements received from many of the witnesses as follows :

(a) There has been a fragmentation of initiatives, a lack of clarity of goals and an indifferent quality of outputs in the R.& D. programmes. Multiplicity must lead to waste. The teaching of English is quoted as an example in which many funds are concerned with the same issue.

(b) The poor co-ordination at federal level is not, however, always regarded as harmful. In effect, it creates a market situation in which the federal authorities buy work in accordance with a plan of their devising. If this be the requisite pattern, the question then arises of how the U.S. federal policy should be devised.

(c) A further complaint is that the systems by which some budgetary items are subject to annual review is disruptive of research continuity. The universities are at present a source of continuity but are compelled, by the conditions under which grants are

given, to employ a floating population of research workers who do not have tenure and whose future is always in doubt. More important, a large number of new institutions which exist on short-term contracts depend on and play up to the whims of Washington.

(d) A division of effort is implicit in the nature of R.& D. work which requires the exercise of wide degrees of discretion - even autonomy - by those receiving the federal grants. The difficulty has been to reconcile scholarly initiative and freedom with legitimate federal purposes.

(e) A further complaint has been about the preferences exercised in the handing out of federal funds. References are made to the "bandwagon" phenomenon in which a fashion of research arrests political attention, often for a short period only, and the research world must either abandon its own interests or be left out of the most powerful reward system for researchers. Others complain of the clustering effect whereby 80% of R.& D. funds are used by only 100 institutions.

(f) There are complaints about lack of academic feed-back to policy-making. The Commissioner's Research Advisory Council is not known as an active body but rather a body giving political cover to the Office.

(g) The quality of decisions made by the Office of Education is harshly criticised. They suffer from guide lines on research design often thought inappropriate by some researchers and are thought supportive of research in irrelevant areas or at standards inappropriate for national support.

(h) On the other hand, expert panels are said to advise USOE on criteria not relevant to some R.& D. functions especially those performed by new institutions with less clearly defined roles.

(i) The academic community does not always respond in its research ambitions to the needs of society. Many of the major researches now taking place came from the initiative of the federal authorities.

(j) There has been insufficient carry-through from one stage to the next - from research to development and to dissemination.

63. It is difficult to make any single sense of these complaints. Most of them must be justified but some of them cancel each other out. The most serious complaints, of intermittent policy-making and lack of continuity, of following the vogue rather than the problems presented systematically by the educational services, derive in part from lack of defined goals

and of structure and in part perhaps from the difference in the time span between the different decision-making structures. The Presidency and Congress work - naturally enough - within the short time cycles created by response to the popular demand, created by their mandate period. Fundamental research may need five or more years in which to unravel a problem. Teachers in schools might have been trained forty years ago. The schools carry with them a conservatism impervious to either political demand or scholarly effort.

64. In the event, bureaucracy gets the odium. University Deans who are anxious to preserve academic freedom, members of the Congress under extreme pressure but without opportunity or, perhaps, the volition to inform themselves precisely about the matters they are deciding, academics anxious to maintain their role, Presidents of both parties anxious to meet a popular demand, school systems that have learned to be wary of whizz kids and of scientism, all somehow have to be reconciled within an institutional framework within which highly sensitive decisions can be made. The Office of Education is chronically under attack both for lack of leadership and for controlling too much and too often. The critics say the Office has no policies but can offer no better in their place. The criticisms lead to low morale and, perhaps, low standards of administration which can never stabilise itself because of constant chop and change at the senior and middle levels. As in all countries, American society needs to make up its mind what it wants of its officials. Does it want defensive bureaucrats or is it prepared to give them enough authority to get on with the job ? And, if so, within what external constraints ?

65. It might be thought that these remarks are exaggerated. We have been amazed, as well as impressed, by the frankness with which each agency described each other's functions. Behind some of the institutional debates are arguments about deep philosophical and policy issues which are essential to policy-making, but which, in default of an adequate forum, dissipate administrative energy as well as, more helpfully, ensure debate about issues that matter. Thus, it ought not to be impossible to reconcile the fears of the educational establishment with the demands of the élitest scientists. The present dominance of the behavioural scientists need not be a source of friction but the centre of fruitful debate.

Federal and State R.& D.

66. Further questions arise about the relationship between the federal and the state and the local authorities. It is easy to see that federal intervention in R.& D. matters is more acceptable than similar intervention in operational work of the state and local districts. Research is expensive of scarce manpower and the results are usable throughout the whole country. The products of research and development can be taken or left by those responsible for those operating schools. It is, perhaps, doubtful whether the federal autho-

rities will get objectives, and their achievement, right if the weight of the federal R.& D. programme is placed on the giving of block grants to the states - as has been urged upon us.

67. In this chapter we have, perforce, given a critical view of organisation of R.& D. at the federal level. Yet the system has advantages often lacking elsewhere : it ensures that the stimulus of competition and of open debate is never lacking in the administration. There are plenty of examples elsewhere of classic organisation which neither produces decisions reliably nor admits of U.S. style debate. But some clarity of structure and focussing of debate are essential to the creation of objectives and management of programmes of this important area of public policy.

68. We turn to some of the detailed questions on organisation in our next chapter which is concerned with the "in-house" relationships of the Office of Education.

CHAPTER V

THE OFFICE OF EDUCATION AND BUREAU OF RESEARCH(1)

69. The chart which follows (Fig.2) shows, in broad outline, the organisation of the Department of Health, Education and Welfare as it affects the Bureau of Research (now the National Center for Educational R. & D. Again, however, we have to say that our comments rely on a necessarily brief acquaintance with the main trends of thought and not on any sustained analysis of organisation.

70. The line organisation of the Office of Education is that the Commissioner for Education is subordinate to the Secretary for Health, Education and Welfare, and, indeed, also holds the appointment of Assistant Secretary to the Department. The Commissioner is, however, appointed directly by the President and is therefore not fully subordinate to the Secretary. The Commissioner is assisted by a number of Associate Commissioners, one of whom is accountable for the work of the Bureau of Research and the others for what are generally called the operational branches. The Commissioner, and his Associate Commissioner, are advised on R.& D. matters by a Research Advisory Council under the Chairmanship of Dr. Ralph Tyler and on individual research projects by readers selected by the Office.

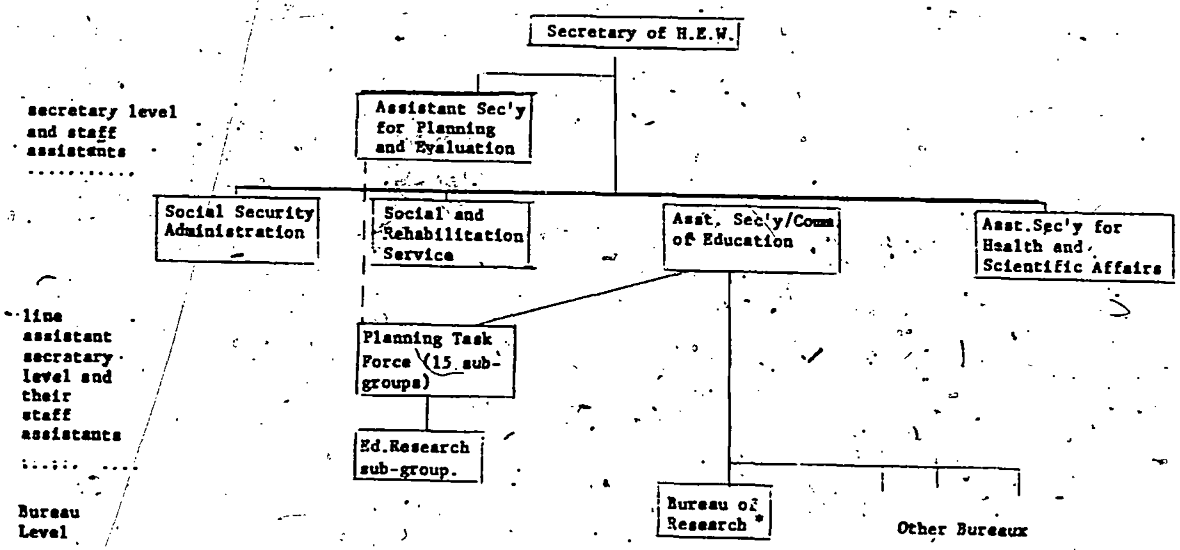
71. Reference has already been made to the fact that the Secretary has staff, headed by an Assistant Secretary, who are responsible for advising him on programme planning and evaluation. At the time of our visits (when new forms of administration were being created) task forces reviewed work of the Bureau of Research, not for the person accountable for that Bureau, namely the Commissioner, but for the Secretary himself. This was a form of looping round, or of contracting of, the Commissioner's authority. Since then, however, all the sub-groups report to the Commissioner of Education who is also Chairman of the parent task force which is representative of many departmental interests.

72. The role of the Assistant Secretary of Planning and Evaluation has not been closely examined. It was not clear how far this role was concerned with co-ordination of all of the services accountable to the Secretary rather than with educational R.& D. as such.

73. It has been pointed out to us that a less complex organisation in the Office of Education, relying on clearly demarcated flows of authority, would be inappropriate because much of its work is not "operational". The federal authorities are sometimes referred to as "cheque writers" because the terms of grant to the States for many programmes are so rigidly constrained by the legislation that no discretion remains with the operating branches. Discretion is probably less than in the equivalent

(1) Now the National Center for Educational Research and Development. Since this report was drafted the changes indicated in paragraph 43 have taken place.

Figure 2. ORGANISATION OF OFFICE OF EDUCATION WITH DEPARTMENT OF HEALTH, EDUCATION AND WELFARE



* Now renamed the National Center for Educational Research and Development (NCERD) and repositioned as a staff function under the Deputy Assistant Secretary/Commissioner of Education.

agencies in other countries but they are nonetheless accountable, we assume, for advising the Secretary on what constraints to ask for, or to oppose in the Congressional measures. and what appropriations to seek. The Associate Commissioners have authority to recommend policies in their fields but there is some lack of balance of authority between them and others within the Department and federal decision-making complex. Close relationships between them and their colleagues responsible for research and development seem essential since many of the research projects are in their discrete fields.

74. From the Office of Education submission, and from our meetings, we observed that the six operational branches of the Office were on the same level and working "collaterally" with the Bureau of Research. All were and are headed by Associate Commissioners accountable to the Commissioner. This was, however, the manifest position and only recently has become substantiated in fact. There is now a clearer sense that the work of the operational branches and the work of research and development ought to be interdependent as the models of R.& D., referred to in Chapter II, should imply. Contacts between the Bureaux are increasingly organisational as well as personal.

75. At the time of making our report the Commissioner was considering a reorganisation by which there might be an amalgamation of research and development, planning and evaluation at Deputy Assistant Secretary level. This would create for him a "right hand man" superior in status to the Associate Commissioners responsible for operational policies. On the basis of our brief examination we can only point out some of the implications of this proposal.

76. First, it assumes that planning, research and development, and evaluation can be located in a single role. Secondly, it assumes that this role should be senior to the operational roles. Some organisational theorists would disagree with both assumptions. "Planning" is, of course, a word of more than one meaning. It can mean quantitative and qualitative assessment of future needs with a view to producing specifications which might be put into effect operationally. In these terms, planning is operational work. Or it can mean the programming of on-going and agreed operational policies so as to ensure consistency of time scales, goal achievement and containment within budgetary and other constraints. As such it is a staff role because it does not, of itself, create operational policies. But in either sense planning is not the same role as research and development, which as discussed in this report, is concerned with the creation of knowledge and of organisational setting within which the knowledge can be deployed. Planning, R.& D., and evaluation are separable and to place them all in one role might compel a single office to undertake tasks not easily reconciled with each other.

77. The test of whether a role is correctly located organisationally is whether issues might arise in which conflicts need to be resolved. An operational policy in, say, higher education might be determined between the Commissioner (A) and the appropriate Associate Commissioner (B). Or it might be determined by the

Commissioner (A) on the advice of the operational Associate Commissioner (B) and of the bureau which can provide data and initiate policies on the R.& D. aspects of higher education (C). But the Commissioner might wish to ensure that operational decisions, and R.& D. activities, form part of a long-term plan linking, say, higher education and teacher education. At that point, Planning (D) would be called in - not to determine operational policies - but to advise the Commissioner (A) about the concordance to be achieved between (B), (C) and possibly much else besides. In this role Planning (D) is in a staff relationship to (A), (B) and (C). More important, its tasks are distinct from any other. If combined with any other role, Planning is bound to take a view that is affected by operational responsibilities.

78. The second assumption is that this triple role of research, development and evaluation ought to be senior to operational roles. But the seniority must imply an authority relationship between the Deputy Assistant Secretary and the Associate Commissioners which, to our knowledge, has not been defined. Will the new D.A.S. have staff authority over the operational Associate Commissioners? Or will they be subordinates? If the latter, will they refer through him to the Commissioner and, if so, on what? These are not issues on which we can be conclusive but we ought to point out that a drastic reorganisation such as this can only be useful, in any government in any country, if specificity of role and of the authority adhering to that role is created.

79. At Office of Education level, the Bureau of Research has its own managerial line - the Associate Commissioner and the Commissioner - but also is subject to the advice of Task Forces officered by staff officers to the Commissioner who might, however, be appointed by the Secretary. This is the "Xmas tree" structure referred to in paragraph 49 above. We have already observed on the sensitivity and clarity of purpose necessary to ensure that such a staff structure does not make an already complex structure even more difficult to run.

The Advice Received by the Bureau of Research

80. The Bureau of Research is advised by the Research Advisory Council, under the Chairmanship of Dr. Ralph Tyler, on the general shape of its programme. In the past it attempted to consider major proposals for grant but relinquished this more detailed and less strategic control in favour of a more generalised vetting of programmes. At present, the Bureau of Research is advised by panels of readers which are criticised as being "peer panels" of those sending in the research. We have heard some complaints about the effect of these arrangements.

81. It is held that the peer panels are not themselves distinguished exponents in the fields of research and development, that they constitute part of the bandwagon phenomenon which reinforces the directions already undertaken by R.&.D. programmes rather than new and creative complexes of thought and action, and that the resulting programmes are often bizarre and irrelevant. We suspect such complaints would be made of almost

any research programme, administered on the advice of almost any set of academics. We cannot test these contentions but feel it right to record them as evidence of the climate within which R.&D. policies are being made.

82. What seems more important - and more capable of remedy - is the need for established institutions by which the federal R.&D. policies can be competently assessed. Once policies are assessed, the administration should be allowed to get on with putting them into effect. They alone are responsible to the elected decision makers. They need to possess general "research competence" but their decisions need to be informed by advice from those who understand, in depth, the criteria for each R.&D. function. The advisors cannot, however, make the decisions.

83. The composition of advisory bodies must thus vary according to the needs of the policies being created and to the tasks allocated to the bodies. But there is a need, at a minimum, for an advisory council structure which helps the federal authorities to create R.&D. policies and to stimulate selected R.&D. initiatives. At the present stage of development, the council should comment on the selection of the initiatives and advise the Commissioner on whether his decisions are right in view of:-

(a) the present state of knowledge in the field;

(b) the capacity of the institutions to be selected;

(c) the specific role to be played by different types of institutions.

84. At present, the R.A.C. provides some academic participation, and hence moral backing, for the work of the Bureau of Research. Its hold is, however, precarious inasmuch as many distinguished people we have met barely know of its existence, let alone have any full idea of its activities.

85. The whole Office of Education structure faces other criticism as well. Some claim that it responds to a clientele of former teachers whose scholarly standards are poor and whose innate conservatism prevents advance. Many educational scholars with whom we have had acquaintance take an opposite view. They feel that the Office of Education pays insufficient heed to the requirements of the school systems. The officials of the federal government really cannot win.

86. We are chary of making qualitative judgements about the performance of the Office of Education which in a large sense is not the business of the examination, although we note that one Congressional enquiry (1964) showed that institutions receiving contracts rated it at the median or slightly above in an assessment of twenty-two departments. Our criticisms must, therefore, be fairly general. The first concern is the almost total lack of appreciation of the fact that, perhaps in response to pressures from outside, but also to some extent from

initiatives from within, the federal Office of Education has got off the ground a large R.&D. programme. Its own submission shows that all is not well with the programme but we believe that due credit to those responsible for programmes is not being given by the critics. Much of the criticism of them have been trivial and unfair. Secondly, we believe that the lack of specificity in roles within the federal administration, with the diversity of agencies surrounding the Office of Education, and uncertainties within the Office itself, is certain to reduce the federal government's chances of getting officials who can give courageous advice, do the work necessary to back it up, and implement decisions once taken. They are fair game for everybody. If they were better at stating what they have done and what they intend to do and if they had clear authority, and accountability, conferred on their roles, much of this unuseful squabbling would cease.

CHAPTER VI

ORGANISATION MODELS OF RESEARCH AND DEVELOPMENT

87. In this Chapter, we briefly refer to some of the emerging organisation and institutions for R. & D. which have been sponsored through the federal initiative. Again, we remark the creditable ability of the American people to create institutions with a speed not found elsewhere. They are to be judged as an attempt to create an interdependent, but differentiated, set of institutions, as well as institutional types, to be judged on their own merits.

88. The existing structures are well described in the Office of Education submission (Chapters IV and V). In the main, research has been undertaken in the Schools of Education of the universities on an unsystematic, personal, part-time and intermittently funded basis. It has mainly (50% to 60% in 1964) taken place in Schools or Colleges of Education. Since the 1954 legislation the single largest facts have been the intervention of federal funds in the R. & D. effort, the creation of new institutions and the creation of new full-time R. & D. roles, all of which have merged or which have to reckon with the older framework.

89. Before discussing the overall structure and the balance of effort between different parts of it, we comment briefly on four main types of institution. They are the Research and Development Centers, the Regional Educational Laboratories, and the National Center for Early Childhood and its six local Centers, and ERIC.

R. & D. Centres (R.D.C.s)

90. There are nine R. & D. centres placed in the universities which are the concern of the Bureau of Research's R. & D. Center branch. (That branch is also responsible for the National Laboratory for Early Childhood Education, referred to later.) The centres derive from the Co-operative Research Act and the programme begun in 1963. The programme was intended to counteract fragmentation in research, gaps between research and practice, and research lacking sufficient expertise. The Office of Education administers the funds appropriate for the centers and also establishes and carries out review procedures evaluating their progress.

91. We can make no judgement on the quality of work in these centers but only point to some obvious characteristics of them. First, they are a genuine attempt to bring distinguished educational research together with development and dissemination. Between them, they cover a wide range of research identifiable with clear needs within the educational service. Secondly, they have successfully infused federal grants, and thus some elements of the national purpose, into the efforts of university scholars, who, nonetheless, preserve their university autonomy. We have been told that there is adequate institutional control. A

judgement made on them by Dr. Chase is: "The evidence to date (1968) indicates that the nine centres are making modest but significant additions to the body of knowledge available for construction of curricula, modification of learning environments, individualisation of instruction, improvement of teaching-learning processes and institutional reconstruction". He adds,"Yet, it must be added that improvements in enabling legislation, funding, management and processes of investigation, development, and diffusion are still needed to assure the conditions essential to sustain advance in educational practice".

92. The universities have mixed feelings about the centers. One major university ceased to operate its center. Others made it clear to us that they accept federal grants for the centers only on their own terms. Others, again, have no serious complaints of the way in which the Office of Education administer the programme. Those who do not receive grants, however, complain about the arbitrariness of the criteria upon which they are funded. As examiners, we cannot make judgements between these sentiments. We simply note that the federal government has found a way of directing the activities of autonomous academics, without affecting their autonomy, other than through the operation of what is, in effect, a free market in research. At least one R. & D. Center, in ways described to us by its Director, has successfully created arrangements with its nearest State Department of Instruction which has become part of its development and dissemination system.

Regional Educational Laboratories (R.E.L.s)

93. R.E.L.s are non-profit making corporations established under amendments to the Co-operative Research Act contained in Title IV of the Elementary and Secondary Education Act, 1965. They are stated to have originated in the work and unpublished report of the Gardner Task Force on Education (1964). They are intended to apply the findings of research, through the creation of curriculum and methods, by work in the school systems and thus bridge theory and practice. They are intended to help reduce fragmentation of effort - of piecemeal curriculum reform, intermittent production of new hardware, and disorganised attempts to improve methodology. They also work out information systems relevant to the general planning and administration of education at various levels. They do not try to restrict development and dissemination within too narrow confines and are indeed engaged on a wide range of work, some of it overlapping with, or being overlapped by, the work of the R. & D. Centers.

94. Again, here, we depend on a report made by Dr. Chase. There were twenty regional educational laboratories established after the passage of the amendments to the Co-operative Research Act of 1965. The first eleven contracts were completed ten months after the Act became law.

95. The R.E.L.s do, indeed, face serious institutional difficulties. To attract good researchers to non-university institutions is difficult since they are completely dependent on the

R.E.L. for career tenure. They inevitably attract the antagonism of those states who believe that research and development ought to figure more prominently in the State Departments of Education, assisted by federal grants and encouragement. The professional educational associations fear the establishment of laboratories, or, indeed, any other research institutions which need not be accountable to any of the educational institutions in which associations have a legitimate voice.

96. Other problems derive from the nature of their work. They, more than the R. & D. Centers are expected to produce "results". They must help the schools to be innovative and bring development into the school systems. They must relate successfully to their sponsors - the federal government, the states, the school systems, publishers, and teachers. They are not controlled by the universities but must be more responsive to their sponsors than the R.D.C.s. This is reinforced by their work orientation which deviates from the university pattern more than does that of the Centers. Within the school community, however, at least some R.E.L.s seem to be accepted as more relevant in their activities than most university-based research.

97. Opinions about R.E.L.s differ. Some are thought to have produced programmes of value, in specialist areas of application. The judgements, however, seem to depend primarily upon what criteria are being applied. They have not had long in which to establish themselves. It is they upon whom the heaviest burden of proof will fall. If anything useful is to appear in the schools from all of the research efforts it will, presumably, be mediated through the R.E.L.s more than any other single group of institutions.

National Laboratory for Early Childhood Education

98. The National Laboratory for Early Childhood Education is further evidence of institutional creativity. The Laboratory is at present based at the University of Illinois. It receives a contract from the Office of Education which it sub-contracts to six centers. The National Laboratory has a director whose task it is to ensure a measure of co-ordination between the efforts of the six centers (which existed independently before becoming sub-contractors) and to keep a balance between expenditures according to a plan agreed with the directors of the six centers. The six directors constitute a Steering Committee which meets regularly and major decisions on the direction of the whole programme are taken collectively. The whole enterprise is advised by an Advisory Committee in whose appointment the Steering Committee (consisting of the six directors) have a voice.

99. The National Laboratory is one example of an attempt to overcome a central problem in U.S. R. & D. planning. The federal authorities need to draw upon leading scholars, in good university centers, for R. & D. Early childhood is accepted to be an area requiring multi-disciplinary study. The Laboratory

seems to be able to relate to the Bureau of Research without any feeling of too detailed direction. But, equally, the centers respond to consensus policies created between the Laboratory Director and the six Center Directors in the Steering Committee. They are thought to provide a predictable research base enabling researchers to get on with their research without constant redrafting of project proposals.

ERIC (The Educational Resources Information Center)

100. A fourth example (and we give here examples and do not attempt to make a comprehensive review) of a recent innovation started from the centre is the ERIC system. It provides digests, announcement bulletins, bibliographies, micro-fiche copies of full reports, hard copies of full reports, research reviews and the like. These are then available and their popularity is shown by the figures of sales in the U.S. Office submission (see Chapter V, Figure 4)(1). The system provides digests enabling researchers to identify work and data of interest to them.

Some Criticisms

101. We find the institutional developments described above impressive examples of attempts to meet complex needs in R & D. We have doubts however about some of the research efforts undertaken by them, and about the "linear" flavour of much of the work undertaken. Before we comment more generally about the implications of these developments we have some other detailed criticisms to record:

(a) there is evidence that expenditures were approved and made without much prior thought. We have already pointed out (para. 94) that the R.E.L.s were approved very quickly after the enabling legislation;

(b) the division of function between R.E.L. and R.& D. Centers implies some deference to the linear model of research and development described in Chapter II. Although the functions of these two types of institutions overlap, and R & D. Centers are not always remote from school conditions, it could be inferred from the existence of the two distinct types of institution that research is separable from its applications;

(c) we have already referred to the tension between universities and the Office of Education over the creation of the R. & D. centers. In practice, however, universities can accept or reject R. & D. grants on their own terms;

(d) we have already referred to our doubts about the teacher's place in all of the schemes implied in these institutional frameworks. We are less worried

(1) STP(69)9

by the fears of the teachers' associations that they will have a reduced access to the sources of R. & D. than if money were sent to the States direct. We are more concerned with the talk still heard of "teacher-proof" curriculum, as if innovation can be received rather than start in the classroom, and by the apparent disjunctiveness between R. & D. and teacher training.

102. The main issue is how far these important examples form part of a framework of differentiated but interdependent roles in R. & D. Between them they dispose of a large sum of money and represent a large federal initiative of time. We have met some cautious approval for what they are doing. It is difficult to see any other range of instruments with which the various tasks of R. & D. could be performed. Their failures, such as they are, might result from the failure of the whole structure to provide properly analysed and articulated goals. They were mounted quickly and in part as a result of political initiatives. The structuring of purpose has had to come later. Moreover, they have had to contend with the natural suspicion of the universities who are likely always to be fearful of federal inducements to undertake new work within federally created institutes. The instruments might therefore be correctly forged but not yet in confident and trusted hands. It is also natural that the scale of these efforts, over so short a space of time, will produce decisions disliked by those who are already reluctant to be won over. The clarification of goals and of the advisory machinery, ought to enhance the work already so vigorously begun.

103. Once overall goals are established and the institutional framework administered with sufficient confidence to meet the criticisms of those who wish to retain the present structures, it will become possible to judge - as we have not been able to - the appropriateness of the different role assigned to each. Organisation is likely to differ widely in response to the tasks accorded the different institutions. For example, those concerned with the forecasting of educational futures are not likely to require the large and widespread sanctions of the school systems necessary in the R.E.L.s which concern themselves with the development, testing and dissemination of new curricula. Because the whole programme covers so wide an area of studies, it will be necessary to establish extremely eclectic performance criteria. It is for this reason that we earlier expressed our concern in case the quantifiable and replicable should be given more favour than other forms of research dealing with such subjects as relationships between school and community and between teachers and students. We cannot ourselves suggest the range of criteria that might be adopted. Some can take their model from that of social engineering. Other programmes must be allowed to rely on intuition rather than measurement and be willingly accepted as high risk projects.

Other Proposals

104. Further and more general questions arise logically here. We have read with interest proposals made by distinguished scholars and educators for the creation of a National Commission on Curriculum (Bloom) and the National Institute of Education (Krathwohl and others). In these suggestions, researchers and administrators seek immunity from what they dislike in the present federal programmes. Intermittency, the bandwagon effect, the insecurity of programmes subject to Congressional and administrative review might be brought to an end, it is felt, if bodies similar to those in the field of medicine were established. It is not easy, however, to see how such bodies differ from what is already established in the educational field. The National Institutes of Health, which are the models for the Krathwohl proposal (and preceding proposals of the same kind), also derive their funds from the government, and are subject to review. They have the benefit of being associated with health, where development is towards normative standards, rather than in education where the whole process is designed to change people and where there is little agreement about the nature of the changes desired.

105. In commenting, therefore, on these new structures, we believe they present hope for arrangements in the future. They must be contingent, however, on a reconciliation of the authority structure within the American government with the power structures, acting through the Congress, and more directly through the Presidency, with which those responsible for ensuring continuity and consistency have to contend. And we believe that the total effort of which they are part would be enhanced by a more general acceptance of the non-linear nature of the change process, and by clarification of programme goals and priorities.

U.S. Office of Education and the States

106. The four examples discussed are cases of federal initiatives A fifth is often not recognised as such. The states receive help under Title III and Title I of the Elementary and Secondary Act. Schools systems are able to apply through the states for grants which can be used for research and development.

107. Some have pressed that R. and D. grants should be "block" rather than "ear marked" grants and thus release the states from any obligation to seek approval for specific proposals. The research community would be opposed to such a scheme. They would see it as a further source of disconnectiveness in R. & D. effort and as support of work that might not be observable, replicable or subject to adequate research standards. There is also widespread fear that it would lead to a reduction in R. & D. effort. Our own view is that they must emphasise the fragmentation which we have already described.

CHAPTER VII

SIZE AND BALANCE OF RESEARCH AND DEVELOPMENT

108. American expenditure on educational research and development is huge by world standards, and has grown rapidly over the last fifteen years. There has, indeed, been some flattening off of the expenditure in recent years but funds from all sources for educational forms of R. & D. probably amounted to $250 million in fiscal year 1968.

109. It is, nonetheless, small compared to the total expenditure in education which was in 1965-1966 (school year) $45 billion and might have reached $54.6 billion in fiscal year 1968. R. & D. thus accounts for .31% of the total educational expenditure.

110. We discussed earlier the extent to which research and development in education can be justified. As O.E.C.D. Examiners, we emphasise again that American practice in education has a massive effect upon educational practice throughout the world. American educational research and development are likely to have an even larger effect proportionately since many of the findings will presumably be replicable elsewhere.

111. Educational research has already produced major results in forms of analysis of the components of educational disadvantage, a reinforcement of what was already known about the importance of early childhood in the educational process, the theory and practice of educational testing and, more descriptively, concepts of organisation which might help provide more flexible operational settings in which educational processes can take place.

112. Educational research and development are all the more important now because education, within its social context, is changing radically in the U.S.A. and, as a minimum, some evaluation and monitoring of the extent and results of the change seems essential.

113. Yet the defenders of educational R. & D. have a large burden of proof placed upon them. So much is asked of educational R. & D. which properly can only be solved by reference to the whole educational system. Too much is asked of education itself when, as so much research has recently shown, the operations of the educational service depend intimately upon the family background, socio-economic class, neighbourhood environment and the like. Yet it is surely a function of educational R. & D. to help establish mechanisms which will ensure balance between these different areas of social endeavour.

114. Against this background of tentativeness and uncertainty, which does not apply in the same measure to other social services such as housing or medicine where the effects are more visible and more related to certain norms of what is desired to be achieved, we have been pressed to make estimates of the proportion of the total educational budget which ought to be applied

to R. & D. In industry, 5% in the least forward-looking or better established industries is to be expected and something approaching 30% in the most radical and sophisticated industries. (The Concorde's development costs will be about four times those of the production costs in the first years of production.) Suggestions varied between 1% and 5% for educational R. & D. One of the many Task Forces advising the Secretary of Health, Education and Welfare has suggested that the sum should increase from $100 million (within the Office of Education) at present to $2 billion within six years. Another report (1964) suggests "higher than our present expenditure but less than one percent of the total cost of education in the United States. The limiting factor is not the dimension of the task but the number of persons available to deal with it." Chapter XII of the U.S. Office of Education submission suggests that $460 m. a year are needed for the development of curriculum units alone - and this estimate excludes any costs associated with R. & D. funds other than development. This figure could be criticised on many grounds but is an indication of the case that could be built up.

115. We are unable to suggest a figure ourselves. Our views can briefly be summarised as follows:-

(a) R. & D. has increased rapidly and while it covers most of the areas that need intensive study and development there are some significant gaps such as the relations of teacher and student in higher education and organisational patterns of school systems. We have also commented in Chapter I on the need for a wider range of R. & D. styles;

(b) sums applied to it are small so that small changes in policy can have large effects on individual projects. The resulting vulnerability felt by the institutions may be unavoidable, however, at this tentative stage of development;

(c) the educational process is so subtle that criteria that might be applied to other forms of research cannot be applied in educational R. & D. As Cronbach and Suppes put it: "The critical test is not assured relevance to education but potential relevance". Educational research is ambitious and difficult to perform well because it cannot assume that educational policy can be defined meaningfully in terms of a partial, one-dimensional objective. Much of the money must be regarded as risk capital;

(d) nonetheless, it is clear that some problems simply <u>must</u> be solved if, for example, some of the largest and most honoured universities in the free world are not to collapse and if some of the world's richest cities are successfully to provide education for the majority of their citizens. The cost of not applying scientific method to some of the problems is

incalculable and, to some measure, the cost of their investigation ought not to be calculated too rigorously;

(e) Education is a combination of applied science and technology and research cannot exist in any justifiable form unless it helps the education services in their tasks. As a general judgement, we suggest that the emphasis ought to be on the developmental, dissemination and innovatory aspects of the R. & D. processes. This is not to dismiss the importance of fundamental research, particularly in learning theory. A further balance is to be struck between "mission-orientated" and more general research. Perhaps two-thirds of federal money is devoted to mission-orientated research. This proportion should at least be maintained.

CHAPTER VIII

QUESTIONS ARISING

116. In this brief report we have necessarily made judgements on large issues, and on a relatively brief acquaintance with the main facts and trends. In this Chapter, we summarise our impressions so that they can be challenged by the U.S. member of the Organisation. We also pose questions that remain to be answered.

117. Our main conclusions are :

(a) There have been large commitments in recent years by the U.S. government to educational R.& D. which constitute a creditable initiative. This is likely to help all Member countries as well as the U.S. educational systems.

(b) This initiative has been accompanied by inventiveness in the institutional arrangements for carrying forward R.& D.

(c) The great advances summarised in (a) and (b) have been accompanied by confusion about the goals that they are meant to serve, disfraction in the administrative authority structure by which priorities can be determined, and by unsystematic and yet narrow criteria by which R.& D. programmes have been established.

(d) As perhaps a consequence of (c), difficulties have not been overcome in bridging the gap between research and practice in the schools through dissemination and installation.

(e) There is also reasonable doubt as to whether the R.& D. effort, large as it is, is sufficiently large.

Further Questions

118. On the assumption that the summary contained in paragraph 117 is a fair description of the state of American educational R.& D., the Examiners recommend that the following questions be posed to the U.S. government in the forthcoming confrontation :

(a) Are educational research goals adequately defined at the federal level, particularly in view of the severe problems facing U.S. society and education ? (Chapter III).

(b) Why are linear models predominant in R.& D. programmes ? (Chapter II). What evidence exists to indicate that these models produce more effective results than somewhat more eclectic standards, for programmes that will allow more genuine participation by teachers alongside attempts to establish research in the more measurable and predictable areas ?

(c) What steps are being taken to create machinery by which educational R.& D. goals can be effectively defined and put into effect ? (Chapter III)

(d) To what extent does the U.S. government consider the creation of an interdependent, but differentiated, network of R.& D. institutions a success ? Could weakness in the system be due to lack of determination in carrying through this policy (of differentiation) on a scale appropriate to the goals particularly in view of the heavy opposition which was to be expected from the established institutions ? Or do weaknesses derive from the original planning of organisation of the differentiated network ? Are alternative means of solving the innovation problems being considered ? (Chapter VII)

(e) Does administrative fragmentation within the federal structure affect the quality of educational research programme ? (Chapters IV and V).

ANNEX A

CALENDAR OF MEETINGS BETWEEN EXAMINERS AND WITNESSES

CAMBRIDGE AND BOSTON, MASSACHUSETTS

April 28th-30th, 1969

April 28th 1969

Mr. F. Wiseman,
O.S.T.I., Cambridge.

Dr. L. Sussman,
Professor of Sociology, Tufts University.

Dr. E. Clinchy,
Boston Public Schools.

Dr. D. Tiedeman,
Professor of Education, Harvard University.

Mr. A. Lockwood and Mr. D. Swanger,
Research Students.

Dr. T. Sizer, Dean,
Harvard Graduate School of Education.

April 29th 1969

Dr. J. Zacharias,
Professor of Physics, M.T.T., (P.S.S.C. Physics Program).

Dr. R.J. Bond,
Dean, Boston State College.

Mr. R.A. Kaplowitz,
Special Assistant to President and Dean,
Boston State College.

Dr. G. Lesser and Dr. S. White,
Laboratory of Human Development,
Harvard Graduate School of Education.

Dr. R. Hind, President, and others from the
Educational Development Centor (formerly ESI)

Dr. J. Bruner and Dr. J. Kagan,
Center for Cognitive Studies,
Harvard University.

April 30th 1969

Mr. C. Jencks,
Director, Institute for Policy Studies.

Dr. D. Krathwohl, Dean,
School of Education, Syracuse University.

May 3rd 1969

Dr. T. Green, Director,
Educational Policy Research Center, Syracuse University.

Mr. S. Archer, Director, and others from the
Eastern Regional Institute of Education.

LOS ANGELES, CALIFORNIA
(one examiner only)

May 5th 1969

Dr. J. Goodlad, Dean,
School of Education, UCLA

Dr. M. Alkin, Director,
Research and Development Center for the Study of
Evaluation of Instructional Programs

Dr. R. Schutz, Director,
Southwest Regional Educational Laboratory.

EVANSTON, ILLINOIS
(Two examiners only)

May 5th 1969

Dr. L. Stiles, former Dean,
School of Education, University of Wisconsin,
now Professor of Education for Inter-Disciplinary
Studies, Sociology and Political Science, North-
Western University.

May 7th 1969

Dr. J. Miller, Director,
National Laboratory for Early Childhood Education.

Dr. D. Matthias, Commissioner of Education, Minnesota
(also a USOE Research Advisory Council Member).

Dr. H. Klausmeier, Director of the
Wisconsin Research and Development Center.

Dr. R. Tyler, Chairman of the USOE Research Advisory
Council.

PALO ALTO, CALIFORNIA

(One examiner only)

May 5th 1969

Dean T. James,
School of Education, Stanford University.

Professor L. Cronbach,
Psychology and Measurement,
Co-editor of Disciplined Inquiry in Education
Stanford University.

Professor E. Begle,
Director of SMSG Mathematics Curriculum Project (NSF)
Stanford University.

Dr. C. Anselm, Director of the Brentwood School CAI Project.

Professor P. Suppes,
Computer Assisted Instruction, Stanford University.

Professor R. Atkinson,
Computer Assisted Instruction, Stanford University.

May 6th 1969

Dr. J. Flannagan, Director, Project PLAN,
President, American Institute for Research, Palo Alto.

Dr. W. Harman,
Director, Educational Policy Research Center.

Dr. W. Platt, Stanford Research Institute.

UNIVERSITY OF CHICAGO

(Two examiners only)

May 6th 1969

Dr. W. Henry, Director of Early Childhood Center,
(Part of National Laboratory for Early Childhood Education)

Dr. R. Campbell, Dean of the School of Education.

Dr. D. Gale Johnson, Dean of School of Social Sciences.

Dr. B. Bloom, Professor of Education.

Dr. J. Getzels, Professor of Education and Psychology.

Dr. C. Arnold Anderson, Director, Comparative Studies Center.

BERKELEY, CALIFORNIA

(One examiner only)

May 6th 1969

Dr. R. Karplus,
Science Curriculum Improvement Study.

Dean J.L. Jarrett,
School of Education.

Dr. R.M. Gagne,
Educational Research Training Program.

Dr. L.L. Medsker, Director,
Center for Research and Development in Higher Education.

May 7th 1969

Dr. R.L. Foster, Superintendent,
Berkeley School District.

Dr. J. Hemphill, Director,
Far West Regional Laboratory.

Dr. E. Goldman, Associate Superintendent, School Operational Services, San Francisco Unified School District.

WASHINGTON

May 9th 1969

Dr. N.J. Boyan,
Associate Commissioner for Research,
United States Office of Education.

Dr. A. Alford,
Assistant Commissioner for Legislation, USOE.

Mr. M. O'Keefe, Chief,
HEW Planning Task Group on Educational Research.

Senator Claiborne Pell (Dem.)
Chairman, Education Sub-Committee,
Senate Committee on Labor and Public Welfare.

Dr. G. Venn,
Associate Commissioner for Adult, Vocational and Library Programs, and

Dr. J.R. Ludington,
Deputy Assistant Commissioner.

May 9th 1969

Dr. C. Williams, Executive Secretary,
Research Committee, Urban Affairs Council.

Mr. E. Elliott,
Assistant Director, Education and Human Resources,
Program Division, and
Mr. B. Martin, Bureau of the Budget.

Dr. G. Robinson, Associate Director for Research,
National Education Association.

Dr. J. Mays, Executive Secretary, Panel on Educational
Research and Development, President's Science
Advisory Committee.

Dr. R. Ottman, Director of Research,
Planning and Evaluation, Office of Economic Opportunity.

Dr. K. Kelson, Deputy Assistant Director of Education,
National Science Foundation.

May 11th 1969

Dr. Hendrik D. Gideonse, Director, Program Planning
and Evaluation, Bureau of Research.

May 12th 1969

Representative Edith Green (Dem.),
Chairman, Special Sub-Committee on Education.

Representative John Brademas (Dem.),
Chairman, Select Sub-Committee on Education.

Dr. Davies, Associate Commissioner for
Educational Personnel Development, USOE.

Dr. E. Pomeroy, Executive Secretary,
American Association of Colleges of Teacher Education.

Dr. A. Rivlin, formerly Assistant Secretary for Planning
and Evaluation, Department of Health, Education and
Welfare, now with Brookings Institution.

Dr. R. Dershimer, Executive Secretary,
American Educational Research Association.

May 13th 1969

Dr. R.L. Bright,
Formerly Associate Commissioner for Research, USOE.

Dr. L. Lessinger, Associate Commissioner
for Elementary and Secondary Education.

Representative Albert Quie (Rep.),
Education and Labor Committee.

Representative Daniel Flood (Dem.),
Chairman, Sub-Committee on Education of the House
Appropriations Committee.

May 14th 1969

Dr. J. Brandl,
Deputy Assistant Secretary for Planning and Evaluation
(Education) also Chairman, Experimental Schools
Planning Task Group.

Dr. J. Allen,
U.S. Commissioner for Education.

Mr. J. Lively,
Staff Assistant to Commissioner.

WASHINGTON

(one examiner only)

October 28th 1969

Mr. H. Blaney
State Department.

Dr. J. Mays
President's Science Advisory Committee.

Mr. M. O'Keefe
Department of Health, Education and Welfare.

Dr. H. Gideonse
Office of Education.

ANNEX B

LIST OF WRITTEN SOURCES CONSULTED

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Mr. GIDEONSE. I testify this morning in my private capacity and as a professional in the field who, as you mentioned, spent some time, 6½ years, in the administration of research programs in the U.S. Office of Education. I am not testifying in my present capacity as a professional staff member of the Senate Subcommittee on Executive Reorganization and Government Research.

What I have to present to the subcommittee stands at odds with much of what you have heard on the subject so far. First of all, I think that educational research is fundamentally different in kind from agricultural, biomedical, natural, or physical science R. & D. Analogies based on those sciences, insofar as they are used in justifying the NIE, can be fundamentally misleading. They lead to misunderstandings which could create significant problems, I think, for the institute.

The second point that I would like to make is that the testimony you have heard so far on delivery systems has tended to be misleading. I want to get into that point in some detail.

Third, you have heard that educational R. & D. is not as expensive or is inherently less expensive than other kinds of R. & D. I believe that that is incorrect. I think it is likely that if educational R. & D. is done in the fashion that it must be done, if it is to have the kind of impact we all seek for it, it will probably be far more expensive than other kinds of research and development.

First, let me speak about the point of educational research being different in character. I think that difference is its inseparable connection to questions of human choice and value. That is true of the outcomes of educational R. & D., but it is also true of the very conception of such research and the conduct of it as well.

There are several ways to talk about this distinction. We talk about experimenter effects. We talk about the effects of experimentation itself or the Hawthorne effect. We talk about researchers being inside the system rather than outside the system. We know how difficult it is to achieve that something called objectivity. Finally, the very act of studying something or being studied frequently alters the situation under study. Let me give a couple of illustrations.

A research project in progress some years ago was sharply criticized. The project in question was studying the effects of reinforcement on learning of young children, and M&M chocolates were used as reinforcement. The objection to the study was not its design. The objection was that M&M chocolates are short-term motivators rather than the long-term ones. Academic advancement clearly requires and depends upon the development of the capacity to be motivated in the face of delayed rewards, and in the eyes of the critics, those children in that experiment were being subjected to experiences which mitigated against the development of the desired capacity.

Another example: When we were initially considering "Sesame Street" in the early years of its funding, we received rather sharp criticism from a Bureau of the Budget examiner on the grounds that everybody knows how terrible television is. Kids already spend too much time in front of the set. "Sesame Street" will encourage them to spend much more time; therefore it is a bad thing.

Another example is Mr. Badillo's question to Professor Moynihan where he asked whether or not the Institute proposal itself was not a cosmetic offering for education in place of the real funding advances that various proponents claim the educational system requires.

Other examples are the controversy about research in the affective domain, by which I mean emotion, feeling, things of that sort. It is an extremely sensitive area, not only because of the problem of invasion of privacy but because in the judgment of various individuals there are serious questions about the propriety of such matters being studied at all. We had the spectacle a couple of years ago of an executive assistant to Secretary Finch of HEW writing a blistering memorandum to Commissioner Allen about sensitivity training and what was being supported by OE funds in sensitivity training because in this individual's judgment such training was diabolical; in his words "its prime reason was the destruction of morality."

Even reading is not immune from debate. Do we study the mechanics of reading and build carefully engineered programs based on our understandings or do we look at reading in terms of the environmental surroundings in which the child is, hoping that whatever the mechanics are of that process going on in his brain and between his hand and his eye, if only we can motivate him, then the reading behavior will result.

Most recently Senator Nelson has been holding hearings on the extension of OEO legislation, and the controversy on the voucher system experiments is another case in point. The argument is not about the policy. The argument is about whether the experiment should be conducted in the first place to evaluate the policy. You have social scientists objecting even to the experimentation.

All these examples illustrate the central unique feature of educational R. & D.: it is always inherently susceptible to moral and political judgment. This is true at conception, when it is performed, and when its application is proposed. This inseparable linkage means that educational research is as much a political activity in the generic sense of the term as it is a scientific one. I think that has tremendous significance for the organizational structure of the Institute, the way it goes about decisions, and so on.

Let me turn to the second point, the problem of delivery systems. I think that the testimony you have heard so far has defined the situation incorrectly. It has done so because it has used language that implies that educational change is akin to a physical process where things are delivered from a place where they are, to a place where they are not. I think that view without substantial qualification is likely to be counterproductive if acted upon. The trouble with this language is that the delivery system concept implies a one-way flow—maybe it should not, but it does. It suggests a kind of status hierarchy in which research and development personnel have or are presumed to have more say as to what kinds of innovations should be sought and delivered.

Educators will tend and do tend to resist the low status implications of being on the receiving end and conversely academicians and scientists will tend to find confirmed thereby their latest suspicious concerning the professional motives and competencies of educators.

Why is responsible innovation so difficult in education? I think one reason is the way in which schools and school systems are organized. No efficient means are provided by which new techniques can be judged appropriate and acquired by practitioners. Equally important, standards and techniques for evaluating the comparative effectiveness of

innovations do not exist. Then finally we have the problem of everything in education being intertwined in questions of value. Do we desire that particular curriculum? Who is "we" anyway when we say we desire it? What else do we want for our children? What ends do they want for themselves?

Like the research and development which could come to guide educational change, change in education is much more closely related to changes in political attitudes and social values than it is to the availability of transistor radios or seatbelts or penicillin.

If I am critical of the idea of the delivery system, what kinds of modifications do I recommend? I think the real need is not a delivery system, but rather the creation of a consumer system—an effective market, if you will, for educational research and development.

The key element in the creation of a consumer or market system for education lies in the cultivation of sophisticated capabilities for many different kinds of evaluation in all educational institutions and agencies. I maintain that evaluation is a kind of research that has basically four aims. It is research that is aimed toward, first, the determination of goals and objectives; second, the identification of ways of reaching those goals; third, the assessment as to whether the chosen way was in fact implemented as intended; and fourth, the assessment as to how closely all the outcomes or products match with the goals originally intended.

I think that the proposal for the creation of a consumer or market system also has the effect of suggesting much more of an equation of status between researchers and practitioners. Rather than being exclusionary in our definition of research, we are now including certain kinds of activities that ought to be carried on in schools, in educational programs, and local educational agencies that are equally valid and valuable as part of the large R. & D. equation and should be stressed.

Now, I would not want what I have said here about delivery systems to be misinterpreted. What I underscore is that, providing a delivery system will not meet the problem unless schools, colleges, and educational agencies are transformed into intelligent consumers and a sophisticated market for the products of R. & D.

I also feel that the delivery system is not something that needs to be added on to the system but is really a frame of reference for the reorganization of the existing institutions within the system. In other words, a delivery system is going to be a modified school in terms of its organization and structure.

What should the Institute look like? I think the kinds of things that I have talked about here, the political dimensions of educational research and change, and the need to create a market impose three requirements on the Institute. One is that its organization fully reflect the political dimension, the second is the need to create a consumer system, and the third is to provide for greater decentralization in the Institute's research and development activities.

By the organization of the Institute I mean such things as the advisory personnel and panels. I mean how the Institute relates to State and local educational agencies and also the Federal educational agencies. OE is just a special indication of a more general problem. I mean how the goals and objectives of the Institute are open to political public decisionmaking processes—and let me underscore that. I

think, of these, the most crucial issue is how the decisionmaking processes of the Institute can be more widely open to the public. At present there are no effective counterbalances to the vicissitudes of decisionmaking within the executive branch or within the science community.

The examiners appoined by OECD whose document I have inserted in the record concluded, much to the dismay of staff personnel at HEW, OST, and the Bureau of the Budget, that this problem of enclosure within the pipelines of the executive branch was one of the key ones facing American research policymakers.

The Commissioner of Research and the Commissioner of Education were without effective authority to match the responsibilities they appeared to be assigned by virtue of their positions in Government. I think that situation is going to have to be corrected. I don't see in the legislation as it now exists that kind of correction. I would hope that it could be built in.

Such corrections can be accomplished principally, I think, by regular legislative oversight. The Institute, its programs, its policies, and its objectives must be brought back regularly before the appropriate substantive committees of the Congress.

I think another technique is the development of a coordinated and effective advisory structure for the Institute. This might be done in connection with the Office of Education's existing advisory structure. It might be done in a piggyback fashion, for example.

A third way of meeting the political dimension would be assuring that the pluralistic requirements of such research and development would be met by allocating significant portions of Institute resources to institutions responsible for determining their own research and development objectives and activities.

The second thing the Institute must deal with is the delivery system problem. I think that here what the Institute must do is to build the market by cultivating and installing complete evaluation capabilities in the educational institutions and agencies of the Nation. As a research function I think that that would be a proper and appropriate thing for the Institute to do. However, that idea or that activity will be very difficult to implement if the basic assumptions now underlying the Institute are allowed to stand the way they are.

I think there is a need to give up the higher status of academicians and scientists implicit in the basic assumptions. There are other assumptions that have been referred to as the so-called linear model where innovation begins in research, goes through development to demonstration, and then application. There is some obvious truth to that. Unfortunately, one can't administer the R. & D. program on that basis and yet that model has in effect been institutionalized in American R. & D. The OECD examiners were quite strong in their judgment and findings in this respect. Many of the ideas and much of the rationale still coming forth, including the Institute and the proposal for the National Foundation, are still based on that model.

Third, I think the need to decentralize substantial portions of the Institute's R. & D. activities will have to be met by in fact lodging major responsibility through the allocation of real dollar resources to institutions outside of Washington proper. I think that is entirely consistent with the decentralized character of administrative responsibility for education and the need to preserve and enhance a rich plurality and diversity of educational ends and means.

Before completing the summary let me just say a few things about the matter of scale. I think it is terribly important how you address the question of how big R. & D. for education should be. It would be a great danger if the Institute were created and it was a big promise only to be broken. We have had 6 years of that and it has created problem after problem. So I urge you to address this question.

Roger Levien testified that educational research is inherently less costly than other research fields. I conclude the opposite. I think the political dimension creates a requirement for a diversity and plurality of educational ends and means, and that means you are going to have to do duplicate kinds of things. R. & D. has to develop alternative math courses, alternative social science courses, alternative models of schools, not just one SST or one acceptable tank or one transistor.

Second, I think the special characteristics of change in education, its psychological and political character, demand a much greater participation in R. & D. There is a necessary cost of duplication of effort. I am thinking here of a question that I think Congressman Landgrebe asked about there being a danger that if you have research being done in many places that there will be duplication. I argue that the duplication is required, that it is characteristic of this kind of R. & D. to overcome what is called the NIH factor—that which is not invented here isn't believed, doesn't get used, hasn't been heard of, doesn't intrude on our consciousness, or any combination of the above.

Third, the requirement for evaluation and operations research capabilities. One could conceive of easily 1 percent of operating expenses being devoted to this kind of activity. School systems are not going to find that in there present budgets. It is going to have to be added on top of, and the Institute would be a fine mechanism for providing that kind of support. With the technical assistance necessary to produce and perform the kind of on-the-job training provided by the Institute, it could be built rather rapidly.

There is a last idea that speaks to the question of scale. I have not really had that much time to spend on it, but I am beginning to think that the reeducation of professional personnel is part of the development function in education. If you think of development as building capabilities that don't currently exist, then you must think about the capabilities represented by the capacities of individual professionals in the field. It is a very widely dispersed, flat kind of system, two and a half, 3 million teachers. They all have to be reached, and I think that part of the development function is precisely reaching those people.

If we add all those reasons and different kinds of activities together, it seems not unreasonable that over the next 25 years we might get to the point where there are as much as 3 or 4 percent of education expenditures going into R. & D. as I have defined it here, or at current levels of funding that would be something on the order of $2 or $3 billion a year.

The reasons these judgments are so important is that they provide the essential parameters for decisions on manpower and institutional development which the Director is going to have to make. Unless he has a firm basis for making these necessarily long-term decisions that are very difficult to defend when you are confronted with the tough requirements of the budget making process, if there is not a congressional basis for this determination, he is not going to have anything

to stand on. He is going to need that kind of support in order to be able to stand against the pressures to serve shorter-term requirements thrust upon him by what administration is in power.

I have made three points. First of all, educational R. & D. has a political character as well as a scientific one.

Second, the delivery system language creates a kind of misimpression about what the nature of the problem is. Better look at the problem as creating a consumer system.

Finally, educational R. & D. is going to be expensive if it is done as it should be done.

I think that summarizes what I have to say. I would be pleased to answer any questions you care to put to me.

Mr. BRADEMAS. Thank you very much, Dr. Gideonse. You have given us an extremely illuminating paper and I think you have raised some fundamental questions about what we are up to here.

Clearly one of the basic points that you have made is that we have got to get away from looking at the research enterprise in a linear way, that is to say, that we put the research nickel in the machine here and we get a product out at the other end of the line. I take it what you are saying is that there must be a much more kinetic, dynamic relationship between the users of research or the practitioners, to use your phrase, and those who engage in the research. Is that a fair statement?

Mr. GIDEONSE. Yes; that is fair. I would modify that just a little bit by saying there are research functions that practitioners engage in or ought to be engaged in, that those functions are legitimately considered part of R. & D. in education and therefore ought to be considered very seriously by NIE. If not present NIE should support them.

Mr. BRADEMAS. What you have just said summons up in my mind the testimony in the last Congress of your colleague, Sam Messick of Educational Testing Service, who testified on his child development evaluative research. That is to say, from the researcher's point of view, we learn from evaluating on-going programs. That is what I take it you are saying.

Mr. GIDEONSE. That is exactly what I am saying.

Mr. BRADEMAS. Let me zero in now somewhat more specifically from this opening colloquy on this question. How can we stimulate and encourage and enable the practitioners to become the more demanding consumers that you would urge them to be? Now you say something about providing—that the NIE could provide, I take it—both financial support and technical assistance to users across the country. This is a very big country with all kinds of users, especially in the field of education. You are suggesting what? That a third of the budget might be allocated to such a purpose?

Mr. GIDEONSE. At the start I think it would be perfectly reasonable to put as much as a third. I am assuming by the way, that that third is the third that is available after you maintain the existing base. I think it would be disastrous if you required a reallocation of existing resources with all the dislocation that is implied by that. This would have to be new money for this kind of function, the evaluation sorts of things, because they do not exist now. This would have to be a third added on to the existing level of expenditure.

Even at present levels of expenditure which I guess are, if you add up all the pieces that are distributed throughout the Federal Government, somewhere around $150 million to $170 million. A third would by $45 million. That seems, if my memory is correct, not that different from money that was talked about at one time for evaluation under one of the titles of the amended ESEA.

What I am saying is that if there is difficulty in getting funds the ESEA route, let's go the Institute route because it is so essential to the ultimate impact of R. & D. I think we could begin with the States, the major cities, many of which already have fledging research and evaluation activities—provide them with resources to meet their evaluation requirements and technical assistance from the Institute to upgrade their staff, their conceptions. Training programs should be used for this also. It would be a multi-pronged attack on the problem, but I think it is crucial. I think without that we will continue to have the same kinds of difficulties we have been having.

Mr. BRADEMAS. Clearly, building in such a capacity for evaluation at the grassroots is indispensable to the effectiveness of the NIE in your conception. I would then put this question to you as an educational researcher.

To what extent is the American educational system equipped and capable today of providing leadership and assistance and education of the practitioners in the field of evaluation?

Mr. GIDEONSE. I think there are very exciting and extremely competent resources with respect to the evaluation question in American education, and they are distributed across the country. I don't think the question, however—and this speaks directly to one of the peculiarities of research in this field—should be objectively answered in the form, do we know where the capability exists? The question really is, how do we create it? How do we let that purpose inform our actions?

My belief is that if self-fulfilling prophecies do obtain in this field, then it would be better to believe that we can build the capability and act on that assumption. There is a great deal of existing general competence in the field of education, and it is just a question of stimulating that in the right direction. I would build the policy on that basis, but as I said I think there are some very strong places—Indiana, Illinois, UCLA, Far West Laboratory, Research for Better Schools, CASEA at Oregon University for example, and other places as well—that have, including the public schools. I think, for example, of Mal Proves who spent a great deal of time in the Pittsburgh schools and has come up with some very strong work on the question of evaluation. This needs to be marshaled for conceptual purposes, and a small cadre of first rate technical assistance people need to be pulled together to get out and talk and work with people on the job and train them right in the field.

Mr. BRADEMAS. Now a somewhat philosophical question. You have made the point that the missions of the NIE will be related to values that people choose, and if your consumers are to be engaged in the process of evaluation of which you have been speaking, by definition people must have certain values they are concerned to achieve.

What is the relationship among the NIE and the evaluation process and these values? That is to say, are you suggesting that there be a list

of values that each school system be handed, to put the point in a rather absurd way, a list of values against which to measure the effectiveness of a particular educational product? Or are you suggesting that the consumers be educated in how to go about establishing their own values, or are you suggesting something else?

Mr. GIDEONSE. I think the last suggestion helping educators and parents and children to state more precisely what it is that they want out of schooling and out of education in a fashion which permits assessment as to whether or not, in fact, it is being realized is the key. This is much easier to say than it is to do, but I think that that is what I am talking about, a process whereby NIE might help aid school systems, colleges, and universities.

My definition of education includes not only the core system as we understand it but peripheral institutions as well; that is, mass media, home study, industry, and soon I would hope that the NIE would adopt that very expansive definition. But I think that it is a question of articulating those values, those goals, those objectives. Also I think it is not so much a question of stating the values as recognizing that whatever your objectives are, they have that value dimension and that, therefore, there is a requirement for a much broader participation in meaningful ways than I think has obtained so far. The press for accountability is a function of the demand on the part of large numbers of different kinds of diverse groups that schools fulfill the objectives that they stated for themselves or that parents and kids would like to state for themselves.

As to the plurality question, I don't think there is any way in this country whereby you could get anything else but the plurality of goals. The more complex our society becomes, the more pluralistic and diverse it becomes. I refer you to Alvin Toffler's chapter in Future Shock on how technology has not diminished the amount of diversity but has in fact increased it such that we are faced with a crisis of choice. There are so many options open to us. What I am saying here is, by all means let's have those options. Let's just be more precise about stating what they are and assessing how it is we can achieve them and how we are doing as we try to achieve them.

Mr. BRADEMAS. I was struck by your plea for greater Congressional oversight as one way in which to assure that whatever research might be undertaken be out in the real world, as it were, because I recall that when we were in Norway last month what the Norwegians called the National Council for Educational Innovation told us that their principal allies, as they sought to stimulate education in the Norwegian school system, were not the educators but the politicians in their national parliament who were much more sensitive to what was on people's minds.

Let me turn to discuss with you, Dr. Gideonse, another issue. I refer to page 7 of your testimony in which you speak "of the so-called linear model—first research, then development, then demonstration, then application," and then indicate that this model has been institutionalized in American educational R. & D. and it still seems to be the basis for new proposals like the NIE and the National Foundation for Higher Education.

Now I hope I have made clear at least in my own conviction that so far as the NIE is concerned the relationship between R. & D., if you

will, on the one hand, and, on the other, and its translation into the system of education cannot be that rigidly demarcated and that there must be a constant, dynamic relationship among the several activities. So I don't have any quarrel with you on that point at all. As you may know, I have been very critical of the administration's proposal for a National Foundation for Higher Education even as an enthusiast of a proposal like the NIE.

I have also been very critical of the Foundation for Higher Education proposal for precisely those philosophical reasons. It has seemed to me that the Foundation proposal incarnates precisely that kind of rigid demarcation between research, whatever that is, on the one hand, and demonstration or application or development, on the other hand. If we establish a National Foundation for Higher Education, on the one hand, with, on the other, an NIE, one of the activities of which presumably would be to carry out and stimulate research in the field of higher education, we shall have only poured more kerosene on the fire in that we shall have made the mistake, conceptually, of saying that there really is this terrific wall between research over here and demonstration over here.

What has astonished me, in the administration that is presumably hostile to the proliferation of bureaucracies is the picture of the U.S. Office of Education with the Bureau of Higher Education here, which is going to be spending program money; a National Institute of Education here, with a higher education shop presumably doing research; and then over here, a $100 million a year Foundation for Higher Education, which is presumably engaged in demonstration and innovation of a kind that would for some reason, not yet clear, not be carried out by the higher education agency within NIE.

Let me pursue this point and then invite your comment. If one were to accept this as an intelligent way of stimulating change and experimentation in higher education, I, for one, do not understand why it would not be equally logical to have the same troika in elementary and secondary education so that you would have, first, an ESEA Bureau spending money; second, an ESEA enterprise in NIE; and third, a national foundation for ESEA because, Lord knows, we need innovation there just as much as in higher education, if indeed not more.

I do not understand, moreover, why we would not have the same kind of troika for the child development field nor do I appreciate why we would not have the same kind of triad for vocational-technical or career education. If one were not being political, in the sense of trying to justify a previously decided-upon proposal, that is, the Foundation for Higher Education, one could simply multiply its foundations. I am now trying to say philosophically I don't understand why we could not have this mushrooming of activities, and who would get how much money would then depend largely on who had the most clout.

Do you understand my point?

Mr. GIDEONSE. I understand perfectly.

I am almost tempted to borrow a saying from Frank Keppel and say I agree, period. But let me add at least one thing and repeat quickly my agreement that I think it does express once again that notion of the separation of function between research and inquiry, on the one hand, and demonstration and practice on the other. In fact, I

think if there were to be a foundation it would inevitably compete with the Institute for resources. If you look at the President's message, it identifies purposes for the Foundation which are virtually what NIE should be doing if it is doing its job properly.

Mr. BRADEMAS. Precisely.

Mr. GIDEONSE. That is true from a policy standpoint.

There is a statement to the effect that the Foundation should—I have forgotten exactly how it is phrased—undertake a general survey of higher education to determine whether innovations are needed and so on. In my judgment that functoin should be done by OE's own policy research arm. And by the way, I think that precisely there is a point which should be stressed. The creation of NIE does not mean that there should not be some evaluation and policy research of a major kind on going within OE still. OE is going to need it just like any other operating educational agency needs it.

I think that one problem of the Foundation for Higher Education is that it sets a precedent. If you have one for higher education, why not have one for elementary, pre-school, higher, ETV, you name it. What I am really saying is that I don't think they have demonstrated the special need for this in higher education.

Mr. BRADEMAS. Last weekend at Harvard I talked both with the new president and the outgoing president, and I must say that they take the same posture, just as did Father Henley who was here the other day from Georgetown University. I have talked to a lot of college presidents and I have not found any enthusiasm for the Foundation for Higher Education save one. It says Federal money for higher education and they understand that, and it says $100 million worth and they understand that.

Mr. GIDEONSE. Right.

Mr. BRADEMAS. But intellectually they don't even understand what this bill is. Some of them still think it is what the administration was proposing a year ago when they came in here, Mr. Finch and Mr. Allen, as a general-purpose program that was going to take over the national defense, loan and college facilities, and everything else. Then, at least it is my own judgment, Dr. Gideonse, some of us just find it very difficult to even take seriously that kind of proposal. Rather than drop a bad proposal, they continued to offer the proposal and then have been scurrying around trying to find some intellectual justification for it. That is my view of it.

Mr. GIDEONSE. May I just add two more comments that I think may help you in your opposition: I think one of the problems with the Foundation proposal is that it separates policymaking for innovation in higher education from policymaking at other levels, and that is precisely one of the questions that ought to be addressed by a single body making the tradeoffs, drawing the interlinkages. It may very well be that the most effective way to deal with higher education is to deal with some other kind of education, for example, following on a proposal that the New York State Board of Regents is now working on whereby you would set up an independent accrediting process that would work in something like the following fashion:

An individual would present himself for examination. He may have gone to school or he may not. He may have had any of a variety of experiences. If he can perform adequately in the face of this kind of

assessment or examination process, the board of regents would award him a bachelor's degree or a doctorate or whatever of the many kinds of licenses that they have.

Now, what this would do is open up a whole new channel to the credential which is, after all, very much of what young people and older people want when they go through the higher education system. If you then opened up this opportunity, you might very well find a large number of people going that route rather than going to the colleges and universities. This would stimulate a kind of concern on their part to begin to revamp their program so they were more exciting and enticing to young people so that the funds would continue to flow and so on.

That would be one way of creating leverage on the system. It does not speak to the higher education system. It does not talk to colleges and universities at all. It talks to the credential mechanism. One should ask what the likelihood is that NFHE, if it were to exist, being beholden to a higher education constituency, would be likely to pursue that kind of route realistically and pragmatically.

Secondly, I think the major difficulty I have is that it is a lousy model of educational change. It is oriented to the old way of doing things, project grants, add-on money, and so on. It is not a structural change. It really does not get to altering the incentive structures within the higher education system. Now that is a complicated problem, but the creation of the Foundation goes against its solution.

I think that it is NIE that should be charged with this kind of thing. As a whole, looking broadly at the field of education from cradle to grave and whether it is in a core institution—schools, colleges and institutions—whether it is peripheral—Peace Corps, television industry, on-the-job training, you name it. These peripheral institutions now involve more individuals every year than are involved in the core system. If NIE is really going to be dealing with education, it is going to have to address that part of the concern.

Mr. BRADEMAS. I appreciate that observation. Let me just make very clear for the record what I am sure you understand which is that I certainly am not hostile to innovation in higher education. The reason I am hostile to this proposal is precisely that I don't think the Foundation will bring it about because of the way in which it has been structured.

Let me ask you this question, Dr. Gideonse. You have been in the Office of Education doing research there. What about the relationship between the NIE and the Office of Education? I will just offer a sentence or two and comment on it. It would probably be the Commissioner's view that he would kind of like to keep his hands on it. He says, "I really don't want to control it but I want those people to be talking to me all the time."

There is another view that says that the NIE ought to be able to spit in the eye of the Office of Education. The structure and the location of the NIE could, I should have thought, been enormously important in determining how effective it can be.

Do you have any comment on that?

Mr. GIDEONSE. Yes, several. One is that the relationship of the Institute to the Office of Education is no different than the relationship of NIE to the other operating educational agencies. The same question

needs to be asked about how NIE is going to relate to States and local educational agencies and professional associations and so on. So in that sense OE's relationship is just a special case.

I can understand having been in the Office of Education for a long time why the Commissioner, or whoever is the designated person, would want to be responsible for both OE and the Institute. I think this is where structural design is necessary so that you have service to the operating agencies and yet that essential character of independence.

The point is that you can accomplish that independence and yet keep that relation by dealing with the structural issues. For example, I should think that if the Director of the Institute were appointed in the same fashion as the Director of NIH out of the competitive civil service but by the President that this gives him a kind of independence which I think would be very desirable.

But on the other hand you could devise the advisory structure of NIE in such a fashion that it piggybacks on the Office of Education's advisory structure. A portion of what the advisory committees of OE would do every time they meet would be to conduct an overview and, an offering of advice and comment to the NIE people. How that would actually work would take a great deal more time and effort than could be explored here, but I think that is an idea that might be profitably purused.

The congressional oversight function is a way that the relationship can be maintained, sustained or initiated. After all, the committees of the Congress look at the operating programs. If you have a regular legislative oversight—and that would be achieved by defining a time certain for the life of the legislation so they would have to come back and get it renewed—and I don't see any reason why NIE could not come to be closely related to OE's operating programs. In the course of exercising the legislative oversight those kinds of pressures can be asserted.

At a somewhat broader and more philosophical level I think you should really very carefully examine the extent to which the NIE proposal, particularly if you are ready to go on the scale required, fundamentaly alters the Federal role in the support of education in this country. Whether you go the departmental route that is being proposed by education associations or the HEW division proposed by Senator Pell in his bill, there needs to be some examination of the larger question of the Federal presence in education if NIE is to really be a big, $1 billion, $2 billion a year operation in the next 25 years which is what I believe it should come to be.

Mr. BRADEMAS. Dr. Levien is saying a billion by 1980, I think.

Mr. GIDEONSE. That is not unreasonable. The point is we will never reach that unless the committees of the Congress state that expectation and thereby empower the Director to engage in the kinds of manpower and institutional development policies which will bring it about. Otherwise it is just pie in the sky.

Mr. BRADEMAS. Would you make a comment about the present structure of the Office of Education for research, its strengths, its weaknesses. That is a subject for an entire speech.

Mr. GIDEONSE. I have been gone for a hundred days and I am not even sure it is the same.

I think the principal reason for the NIE proposal is that OE's research program is buried. The level of personnel that can be attracted to it by virtue of the grade structure means that you have to rely upon the professional missionary zeal and opportunity for service to recruit people, at presnt you are forcing such people to give up the income that they are at or the position and the status that they are used to dealing with to come into the Office of Educaion to manage research.

The NIE proposal elevates the level in the hierarchy in terms of who they can recruit, and I think that is absolutely essential. There is just no argument about it so far as I am concerned. That I think is the principal problem with the present structure. As I say, I have been out for a hundred days and I have been worrying about a whole new set of problems. I know they are trying to anticipate the creation of NIE by doing a considerable amount of planning. But it is very difficult to move when you have extremely scarce resources.

I think that the present position of research in OE mitigates against getting the kinds of resources it needs. The decisions are made inside that executive pipeline. In my experience the Associate Commissioner of Research really has very little authority over how funds are actually allocated. I understand that he should not have that much authority about how much is finally allocated. That is the nature of the budget process. But he ought to certainly have authority about the way it is allocated within the total amount. In fact he does not.

I believe research has not gotten that much support because of the infrequency—that is a generous phrase—of the legislative oversight to this point from the substantive committees. That would sum up what I would have to say about it.

Mr. BRADEMAS. On that latter point I would just like to say what you may already understand, that one reason that I feel it is so important to take a great deal of time on the NIE is not to delay consideration of it, but to try to build some basis of understanding of the whole subject matter on the part of the members of this subcommittee so that down the road we shall be able, much more effectively and intelligently, to consider to do our legislative oversight, perform our legislative oversight function.

I just have one final question, Dr. Gideonse, before we turn to our next witness.

We shall on Friday be having a number of top people from the Office of Education in hearings before this subcommittee. You have remarked earlier that even if we were to establish an NIE you felt that a research capacity should be maintained in the several bureaus of the Office of Education.

Mr. GIDEONSE. Research in the broad evaluation sense, the full range of activities that I was talking about—goals assessment, alternative means of achieving those goals, whether or not they were implemented as chosen and whether or not the products and outcomes of the programs that were implemented indeed had the kinds of effect desired. I think it is terribly important that I feel that that be close to the program and distributed fairly generously throughout the structure of OE. I can understand the desire to collect it in one place, but I think it is needed in many places.

Mr. BRADEMAS. Dr. LaVor has a question.

Dr. LAVOR. When the committee was in Europe we were struck by the fact that Europeans are doing research in essentially the same areas we are and yet they spend only a million dollars in Norway and $750,000 in Great Britain. On the other hand we spend over $100 million a year in the United States. Why is it so expensive to conduct educational research in the United States?

Mr. GIDEONSE. Well, I am not sure that it is more expensive to conduct it here, except for the obvious reasons of standard of living and so on which is not what you are getting at. It is not more expensive, we do more of it and yet we do nowhere near enough of it. I think what you have to ask is a whole series of questions about how and why the decisions about the level of support for educational R. & D. are made. How much of the total resources are available? What proportion does that represent of the whole? What would they really like to be spending if they had their druthers? What ought to be spent if the desired impact and effect is to be achieved?

I have made an argument here that $100 million is a drop in the bucket. You can cost the figures out for yourself. Just suppose for the sake of argument that you were to do curriculum development on the scale that NSF has done it in the physical sciences and mathematics and to do it in all curriculum areas for all levels. Just take round numbers, $5 million per course. It is conceivable that you could easily do 200 courses or about sixteen per grade level for each of the 12 years. Two hundred courses is a billion dollars right there.

If you want to redo those curriculum packages every 5 years, you can see a rolling expenditure of $200 million a year just for that kind of curriculum development. And that is only one way to approach the question of R. & D. for curriculum purposes. There are other techniques, structural innovations in schools, for example, whereby you might have curriculum development actually ongoing in schools. It would be a kind of administrative and organization approach to curriculum in local school systems. You can multiply those kinds of possibilities on out.

We think nothing, you know, of putting a billion dollars into the prototype of one tank, and yet look at what experimental schools are receiving, the new program in OE, by comparison. A billion dollars for a tank! I would argue that an elementary school is a damn sight more complicated than a tank for a whole series of reasons, not the least of which is the value problem, and yet we don't have those kinds of resources nor are we thinking on that scale. I think we ought to be thinking on that scale.

So I would argue in summary it is not that we are terribly expensive. We are, relatively speaking, but it is very interesting to note that the Swedes and the Norwegians and the British use our expenditures as a basis for justifying increased appropriations from their respective parliaments and legislatures. They see the need for a considerable amount more than they now have.

As for the question of duplication, I think that a good portion of that is explained simply in cultural differences that do include differences in findings and purpose, technique and so on that are important to attend to.

Finally, I would conclude by noting that the difference in the expenditure levels is also explained by some fundamental differences

between the United States and, say, Norway and Sweden. Compared to them, American schools have to deal with a vast heterogeneous population. There is a wide and deeply significant economic differential in our society from the lowest fifth to the upper fifth. We have serious racial animosities, and those animosities are very frequently exposed and encountered.

All of this places a tremendous burden on our schools, and therefore also on R. & D., to serve many different kinds of purposes and objectives, and to produce as a consequence alternative programs to serve that diversity.

When this is coupled with the fact that our school systems are decentralized while theirs are centralized, then it becomes apparent that local determination of educational goals in the face of cultural, geographical, and political diversity means that evaluation must also be decentralized since what works in one place is quite unlikely to work in another place in quite the same fashion. All of these factors—diversity, cultural pluralism, the requirements caused by the decentralized administration of schools—lead to the need for much greater amounts of money for R. & D. in this country.

That is kind of a long answer to your question, I hope it gets at what you wanted.

Dr. LaVor. The second question—and this really gets to the heart of the matter—your example of the tank aside—and I think you will find most members on this committee in agreement with it—you said before that in the Office of Education the resources are extremely scarce. Given the political realities which go along with that statement and given the potential for the next 5 years, assuming that there is not a drastic shift in policy and assuming that there are just limited resources going into the Office of Education, how much money do you think could be expended rationally and sensibly by NIE if new money were made available? How much could they properly expend?

Mr. Gideonse. I cannot answer that question just setting here. I mean that is a question of detailed analysis of how many people are available right now, how many training programs you could mount, how quickly. That is a detailed, step-by-step, item-by-item kind of thing.

Dr. LaVor. $1 billion in 10 years, $2 to $3 billion in 25 years?

Mr. Gideonse. I think that is reasonable. If you look at the experience of NIH, for example, that is the progression of expenditure that they built up over the same period of time.

Dr. LaVor. But given the limitation of funds now——

Mr. Gideonse. There is where I can't accept your assumption which was based on another assumption which you didn't state that the executive branch makes policy. What I am suggesting very clearly, I think, is that the Congress has a say about policy and that in the actions that are taken with respect to this proposal, Congress could very well assert what it wants to see as policy and begin to make the kinds of proposals that would lead to a redressing of the priorities such that this function can be supported in the degree that it should be.

Dr. LaVor. Let me remove all of my original restrictions and ask if you were on this committee, what would you recommend NIE have as a budget for the next 5 years, which by the way, is a requirement of

the House now that legislation which comes out of committee must have projected 5-year authorization?

Mr. GIDEONSE. I think what I would do is base it on the desire to be in a decade at about the billion dollar level.

Dr. LAVOR. I am asking based upon your experience, how much can they rationally and sensibly spend?

Mr. GIDEONSE. I would have to do it, I guess, on the basis of summing a number of things. I think they could probably use, assuming a base of what, right now—about $100 million. They could probably go quite quickly up by $50 million increments next year or the year thereafter and then if they use those funds properly, they could probably increase at somewhere on the range of $60 million a year, and then each year after that by the same proportion that the $60 million bears to the whole in fiscal year 1972.

Figuring this way you come out with the billion dollar figure by 1980 or 1981. It is a question of planning, training the manpower, and developing the institutional base. The bulk of the resources in the first 2 years would probably be put into institutional and manpower development and the beginning of activities, the design of training programs and the filliing of them with people leading to 1975–76, where you have a whole new raft of people coming out who could then be engaged full time in this activity. It is not inconceivable, I think, to get very quickly up to the billion dollar figure.

Mr. BRADEMAS. Thank you Dr. Gideonse, for answering our questions. We found your statement extremely valuable.

Mr. GIDEONSE. Thank you very much.

Mr. BRADEMAS. Our final witness this morning is Mr. Kenneth Komoski.

Mr. Komoski, we are glad to have you with us. Go right ahead, sir.

STATEMENT OF KENNETH KOMOSKI, EXECUTIVE DIRECTOR, EDUCATIONAL PRODUCTS INFORMATION EXCHANGE INSTITUTE, NEW YORK, N.Y.

Mr. KOMOSKI. Thank you, Mr. Chairman.

I have prepared a rather lengthy statement which I will summarize for you. I have submitted it to the committee, and it is long because I have tried to deal with some of the questions implicit in that which the committee asked of me. I have dealt in depth with the question of what schools use and why and the problems of evaluating those materials.

I also, with your permission, would like to submit to the record a copy of a paper I did for an international conference in Buenos Aires last summer, entitled "The Radical Relatedness of Education and Technology." I offer this paper because I believe it reinforces some of the points Mr. Gideonse made regarding the consumer model in education and that technology has made it inevitable that more and more options are constantly created. The job is to deal successfully with these options.

Mr. BRADEMAS. Your statement and the paper you refer to will be inserted in the record.

(The prepared statement and paper follow:)

PREPARED STATEMENT OF P. KENNETH KOMOSKI, PRESIDENT, EDUCATIONAL PRODUCTS INFORMATION EXCHANGE INSTITUTE

INTRODUCTION

Mr. Chairman, my name is Kenneth Komoski. I am President of the Educational Products Information Exchange Institute. The Institute is usually referred to as EPIE (pronounced "eppy"). It was chartered in 1967 by the Regents of the State University of New York as a nonprofit corporation. It is a consumers union for member schools and school systems in 50 states. With support from these schools, other members, and foundation grants, the Institute conducts independent studies of all types of educational materials and equipment. It publishes its findings in nine Educational Product Reports each year. At present, these reports reach about 3,500 educators in schools, colleges, and other institutions.

Prior to organizing EPIE, I served as co-director of the Institute for Educational Technology at Columbia University. While in that position, I edited the first publication to document the fact that many educational materials which schools assumed had been developed through a process of field testing and revision—a process which EPIE has labeled "learner vertification"—had, in fact, never been tried out and revised on the basis of feedback from learners prior to publication.

Before joining the University, I directed a nonprofit research and development organization which had pioneered in the creation of learn-verified educational materials. I have also been a classroom teacher, the head of a junior high school and a special consultant on educational technology to UNESCO and to the U.S. State Department.

During the past year, I have served as an advisor to the Rand Corporation's Study for the National Institute of Education and as the chairman of the forum on Educational Technology at the 1970 White House Conference on Children.

My research efforts in educational technology have focused primarily on improving student learning by improving the effectiveness of the materials from which students are expected to learn.

Point 1.1—Educational technology: effectiveness then efficiency.

I believe that unless educational technology is focused first and foremost on the improvement of learning, it becomes simply a means of making education seem more efficient without being truly effective. Once the difficult goal of effectiveness is being consistently achieved, education can easily be made more efficient. To proceed in any other fashion means leaving the ultimate educational consumer—the learner—in a constantly vulnerable position.

One important function of the proposed National Institute of Education must be to conduct research and provide leadership that will guarantee all American citizens that every educational material from which children are required to learn, is as effective as we know how to make it.

What I have to say to you this morning will clearly indicate that there is an enormous need for better educational materials, and an even greater need for procedures that will guarantee their continuous improvement. The proposed National Institute could provide many of the means and methods upon which that improvement depends.

THE PRESENT SITUATION—WHAT SCHOOLS USE AND WHY

Point 2.1—50 million children are unprotected from inadequately developed educational materials.

My review of the present situation regarding the development, selection, and use of educational materials has led me to the following conclusion: At this time of national concern over consumer protection, the largest single group of unprotected consumers is made up of the 50 million schoolchildren who are being required to learn from educational materials almost all of which have been inadequately developed and evaluated.

The materials I refer to are the textbooks, films, tapes, kits, and complex multimedia systems that are the concrete artifacts of learning in our schools. These materials are the tools of learning, constantly used and depended upon by teachers and students alike. Indeed, one can conceive of a school without walls, or even an educational system without schools, but a modern educational system without tools—in the form of a variety of educational materials—is inconceivable. Today's education requires that these tools be better, sharper, more dependable—in other words, more effective—than ever before.

Point 2.2—Improved materials are urgently needed because of growing demands for: individualized learning; greater teacher accountability.

This requirement is urgent. The interaction of two growing trends in education demand it. The first is the trend toward more independent, individualized learning on the part of students. The second is the demand for greater accountability on the part of teachers. As these two trends continue to build, the need for materials of demonstrated dependability and effectiveness will become more and more acute. If materials with these qualities are not generally available, neither students nor teachers can be expected to meet the new demands being made on them.

We are only now beginning to comprehend the need for learner-oriented, individualized educational materials. For decades educators have talked about the fact that learning is an individual act and that each learner must ultimately have an individualized program. Today there is growing evidence that this talk is finally being translated into action. But those educators who are acting—by establishing new types of individualized learning evironments—are beginning to realize that the quality of the materials they put into the hands of learners is a critical factor in the success of their new programs. When, in addition, these educators are likely to be held more rigorously accountable for the learning of each individual student, they are going to pay even more attention to the quality and appropriateness of the materials being made available to them. However, if higher quality materials are not generally available neither teachers nor their students can be expected to be held completely accountable for learning failures.

Point 2.3—Schools use inadequate materials because they must use something.

But the overwhelming majority of the materials now used by schools are not of "the highest possible quality." Thus, to answer the questions the Committee has put to me as succinctly as possible:

"What do schools use?"—They use what's available.

"Why?"—Because it's available, and you can't run a school without materials.

During the last two decades, new technologies, new media, and Federal money made possible enormous and continuing increases both in the production and purchasing of these traditional group-oriented educational materials. This is not to say that Federal money hasn't also helped to develop a small number of new, more effective, learning materials. It has. But for every Federal dollar spent since 1958 on the development of new, more effective materials, hundreds more have also been made available to schools for the purchase of materials that are much less effective than they should be.

Point 3.1—Modern technology is producing quantity of trivial options—but teachers and students need high quality alternatives to these inadequate materials.

The result is that educational purchasers are being presented with a tremendous variety of options—even more than are offered to the American car buyer. But, as is the case with so many of those automotive options, the educator's options are too often trivial variations on overworked and, in the long run, ineffective themes. Today's teachers and students do not need an ever increasing quantity of options. What they do need desperately are high quality alternatives to the inadequately developed materials they are now required to use.

Before I turn to this crucial question of quality, I want to take a few minutes to examine in some detail the quantitive growth of educational materials during the last two decades. My examination begins at a point seven years before NDEA began to prime the materials-purchasing pump with Federal dollars. In 1951, the American Educational Catalog—the only source that attempted a comprehensive catalog of materials developed for use in elementary and secondary schools—listed some 5,600 items. Although some workbooks and films were included, almost all the items were standard textbooks with standard formats, designed for use in the standard (30 student) American classroom by the "average" teacher teaching "average" students. Other less comprehensive catalogs may have contained additional listings of perhaps five to eight thousand items, mostly films, many of which had not been produced primarily for use in schools. But a safe estimate of strictly school-focused materials would be in the neighborhood of 10,000 items.

Twenty years later, the 1971 El-Hi Textbooks in Print, the successor to the American Educational Catalog, lists about 14,000 textbooks. The publisher, R. R. Bowker, estimates that the catalog also refers to 56,000 workbooks and other supplementary materials marketed along with those textbooks. The increase appears to be tenfold. Bowker has also published separate catalogs compiled at the University of Southern California, of films, filmstrips and transparencies.

These catalogs list some 55,000 additional items, only a few of which are included as nonbook supplementary materials in Textbooks in Print. Taken together, the materials listed in all Bowker catalogs total 126,000.

But that is not all. During the last year, Westinghouse Learning Corp. has published a seven-volume catalog called Learning Directory, which covers all media, and lists 207,000 items. And even this ambitious effort inevitably falls short of presenting a full picture of the materials available to schools. Every such "comprehensive" catalog is obsolete the moment it is printed: its potential content is constantly growing both in number of items and in kinds of media.

For instance, the information you are now looking at is being projected from a film transparency via an overhead projector. In 1951, there were no overhead transparencies for use in schools. Today, a USC-Bowker catalog lists approximately 13,000 sets of transparencies. The Westinghouse Directory lists 15,000 sets, and EPIE estimates that there are actually over 20,000 sets commercially available for school use. EPIE's estimate exceeds both the Westinghouse and USC-Bowker listing largely because neither managed to identify all commercial producers of transparencies; indeed, EPIE is not certain it has identified all of them. Furthermore, this estimate of 20,000 does not include the hundreds of thousands of transparencies that are produced by the schools themselves. And transparencies are just one of the many kinds of media which have been introduced into the schools since 1951.

In 1951, 16-mm. film had just begun to be used widely in schools. Other uses of film, Super 8 film loops, 35-mm. sound filmstrips, and EVR (Electronic Video Recording, actually film) had not yet appeared. Likewise, school use of audio tapes was some years off, and video tapes had not even been invented. The use of programmed instruction books and teaching machines was a decade away; and computer-assisted instruction (CAI) a bit further. Stimulation games were even further in the future; and today's most "in" materials—multimedia instructional systems—were unheard of.

Today, twenty years later, schools have available to them at least 50,000 instructional film materials—16-mm., 8-mm., and 35-mm. filmstrips.

There are upwards of 20,000 audio tapes which schools may purchase or rent. Thousands more are being produced and used locally by schools themselves.

Although a recent survey by National Instructional Television indicates that approximately 85 percent of the instructional television being broadcast to schools is provided by only 223 video tapes, an estimated additional 10,000 one-inch, ½ inch and ¼ inch video tapes, produced both commercially and locally, account for hundreds of thousands of nonbroadcast hours of television instruction.

In the ten years since they were introduced programmed instruction materials for school use have increased from a few dozen to approximately 4,000, approximately five hundred of which must be used in specific types of teaching machines. All of these programs could be adapted to CAI, and many have been.

Simulation games for education are still in their infancy. However, there are now 404 cataloged for school use, and the publisher of the catalog estimates that twice that number are nearing completion.

Multimedia kits are perhaps the most difficult instructional materials to quantify with any reliability. Many of them are sold as parts of instructional programs based on textbook series; others are sold to stand alone. Some are made up simply of a book and audio tapes, while others contain a great variety of assorted materials and equipment. Thus, it is impossible to arrive at an exact count, but they clearly number in the thousands.

Point 3,2—There are at present well over 200,000 education materials being marketed to schools.

Overall, the growth in all types of materials since 1951 may be described conservatively as an increase of about twentyfold; from something over 10,000 in 1951 to well over 200,000 in 1971.

As I have mentioned, much of this growth was made possible by advances in production technology, the appearance of new media—and increased purchasing power with Federal funds. But there have been other factors, as well, ones which have contributed to the quantity of materials but which primarily are related to the question of quality. The have brought about materials of greater social relevance and materials with new teaching approaches and/or more valid and up-to-date content. Unfortunately, these factors have only indirectly contributed to the improvement of the learning effectiveness of the materials they have introduced.

The first of these additional factors, social relevancy, has been responsible for the introduction of new subjects into the curriculum. Thus we now have materials in "Black Studies," in "Sex Education," in "Environmental Education" or "Ecology." And who in 1951 would have predicted that today third-grade pupils in elegant Public School # 6 in New York City would be using instructional materials on the dangers of narcotics?

The second of these factors has been the appearance of new approaches to teaching and learning; e.g., learning by discovery, by simulation, or, as is the case with the Initial Teaching Alphabet, a new orthography. All of these approaches have been quickly supported by new instructional materials, including many which have completely restructured traditional subject matter, so that we now have the "new math," "Project English," and the "new social studies," to mention a few.

Point 3.3—New methods of developing educational materials.

An important handful of these new departures—funded by Federal or private foundation support—have also managed to help pioneer new methods of developing educational materials.

"Biology," for example, has been a high school course since the 19th century. In 1951, it had been essentially unchanged since that time. Basically, it was a course in taxonomy, and the most widely used standard textbook available was Holt's "Modern Biology;" essentially a compendium of taxonomic information, designed for use in the traditional teacher-dependent, "average" class of 30 "average" students. A decade ago, the federally-supported Biological Sciences Curriculum Study Group began work on a new biology course. But because the group of prominent educators and biologists assembled did not agree that all students could best learn biology from a single approach with a single textbook, their work produced three separate approaches to the learning of biology: a "cellular" approach, a "biochemical" approach and an "ecological" approach.

Point 3.4—Learner-verification and revision a major new departure in product development.

In addition to these new departures, the developers also took a new approach to the development of their materials: they thoroughly evaluated the effectiveness of their materials on a group of learners and revised them accordingly, before they were released for commercial distribution. This process of learner verification and revision emerged about a decade ago, primarily in the development of programmed instruction materials. Since that time the process has been adopted by many Federally-funded product development programs, but by very few commercial producers.

One reason why commercial producers have not adopted the verification process may be that few schools look for evidence of learner-verification when selecting curriculum materials. This would explain, at least in part, why—ten years later—the non-verified "Modern Biology" still holds on to a significantly portion of the school market. Another reason is that new materials with new approaches are harder to sell. They often (as is the case with the BSCS materials) require a certain amount of teacher retraining, while the traditional text is as easy for teachers to slip into as an old shoe. Besides, as Edward Katzenbach, former President of Raytheon Education has put it, "The money is in the old stuff, not the new stuff."

PRESENT STATUS OF THE EDUCATION INDUSTRY

Point 4.1—Small size of the industry and small size of school expenditures for materials.

Last year's total sales for all educational companies marketing book and nonbook media (but not including equipment) were no more than $600 million, whereas, 185 single companies in Fortune Magazine's list of the country's top 500 had sales exceeding $600 million. This $600 million represents less than 2 percent of the country's school budget. Or, put another way, local schools are spending less than 2¢ of every budget dollar on the tools of learning. Interestingly, during recent years the average school system has received just about 2% or its budget through Federal support. A major reason why the fortunes of the educational industry have been so closely tied to the availability of Federal money for local schools.

The fact of the matter is, however, that when compared to other important American industries, relatively speaking the "real money" is just not in education, at least not at present. Today, the educational materials industry is small when compared to most others.

Nevertheless, futurists and economists predict that the educational industry will grow into a major American industry in the years ahead. Assuming they are correct, now is the time, while the industry is still in its economic infancy—and schools are still spending relatively little on its products—to encourage it, cajole it, give it guidance, and, if necessary, to manage Federal support in such a way that money is available to help develop and purchase products of proven worth.

Everything that can be done must be done to get the education industry to fulfill its potential; not by providing the schools with endless—but in the end, trivial—options, but by supplying effective alternatives for individual learners. The potential impact of its product is enormous. These products contain materials that introduce (or fail to introduce) skills, concepts, facts, and understanding into the minds of 50 million young Americans for twelve crucially important years. No industry in the country produces products of greater importance or potential.

As the late Robert Locke, who, as executive vice-president of the McGraw-Hill Book Co., was one of the most forward looking leaders in the education industry, wrote in a recently published Saturday Review article entitled, "Has the Education Industry Lost Its Nerve?":

Point 4.2—Industry's capacity to apply research findings.

"The most encouraging sign is that educational research is finally beginning to lead instead of follow educational experimentation.

"The education companies vary greatly in their research and development abilities, but in general it can be said that few of them have any capacity at all, to do basic research in education, a function that can best be undertaken in the universities and in organizations devoted solely or largely to research. On the other hand, industry clearly has the capacity to apply research findings to experimental product development."

Mr. Locke concluded by saying: "In fact, the chief contribution of industry may come through its ability to apply the findings of research to the development of products and services for education."

Point 4.3—Present lack on the part of industry.

I am in total agreement with Mr. Locke concerning the education industry's capacity to apply the results of research findings to product development, but my analysis of the current status of product development within leading education companies indicates that the industry is a long way from doing so. The research findings to which Mr. Locke referred clearly indicate that the learning effectiveness of a product can best be improved through the process I have referred to as learner-verification and revision.

These terms are simply a researcher's way of saying that the learning effectiveness of a product will be improved if it is taken through a systematic cycle of tryouts with learners followed by revisions based on the feedback. Such evaluations need not always involve large groups of learners. Through appropriate sampling a small group of "target" students can give the product developers ample opportunity to catch errors and trouble spots and to revise accordingly.

As you can see, the learner-verification and revision process sounds like a commonsense approach to development which producers might have discovered for themselves long ago. Indeed, it has been in use in the development of standardized tests for several decades and, as Mr. Locke pointed out elsewhere in his article, the researchers who developed programed instruction a decade ago were the first to apply it to the creation of learning materials. However, four years of research by the EPIE Institute into almost every class of materials from textbooks and films to multimedia kits have convinced us that although this research-generated process is becoming more generally understood by educational producers, their capacity to apply it remains, in fact, virtually unutilized.

Point 4.4—99 percent of present materials are inadequately developed.

As a result we estimate that 99 percent of the materials school children are now required to use have not been put through even the initial phases of the learner-verification and revision cycle. If this statistic is disturbing, the picture in particular product areas is even more so. For instance, our investigation in the area of textbooks indicates that under one percent of the approximately 14,000 textbooks being sold to schools has been systematically shaped through the learner tryout and revision process.

Our study included an analysis of the best selling texts-plus-media-supplements in major elementary-high school curriculum areas. This "best seller" list

eventually grew to some sixty different texts and their related materials. Less than 10 percent of these had even been field-tested prior to publication! I say "even" because the field-testing of textbooks is rarely synonomous with learner-verification and revision. In some cases, for instance, reactions from salesmen in the field are referred to as "field-testing." But when "field-testing" refers to actual tests of the materials with students, it is done usually just prior to publication with no chance of using the results to improve the product. Such testing is done in the hope of impressing purchasers that the materials in question have actually been used in schools. Thus it is important not to confuse traditional field-testing of textbooks with the learner-verification and revision process.

Extrapolating from these sixty "best sellers" to all 14,000 textbooks we may estimate that ten percent or 1,400 of these have been "field-tested," in some fashion. But the percentage that have been through learner-verification and revision is minuscule.

In the educational film field, the amount of field-testing and/or learner-verification and revision is even less. In the area of broadcast video taped instruction, where EPIE has drawn upon the research of the National Center for Instructional Television, we discovered that only three of the 223 materials used in over 85 percent of broadcast instructional television have been learner-tested. In other words, only a little over one percent of the television material used in schools has been learner-verified.

The director of the National Center for Audio Tapes at the University of Colorado told EPIE that while he had no statisical data, it is his opinion that practically none of the estimated 20,000 tapes now available has gone through the verification-revision process.

By far the most discouraging area we have investigated is that of programed instruction. As Mr. Locke and others have pointed out, research in programed instruction did much to develop and refine the process of learner-verification and revision. One would, therefore, expect to find that all (or at least the great majority) of such materials would have been thoroughly tested. Such is not the case. EPIE's examination of 633 of the programed items now in use in major curriculum areas in schools revealed that research evidence was available for only 7 percent of these materials, while some "field-testing" was claimed for another 8 percent. A cursory examination of the remaining 3,000 programs less central to the school curriculum indicates that even a smaller percentage of those seem to have been learner-verified.

Recently, EPIE surveyed a sampling of major educational procedures—some of whom produce programed materials and all of whom have begun to move in the direction of "systems of materials" involving a multitude of media and methods. We got in touch with them in order to ascertain their present attitude toward field-testing, learner-verification and product evaluation.

Here is a sampling of their comments as reported by our telephone interviewer:

Point 4.5—Interviews with producers indicate lack of attention to testing of materials.

(Company A, Vice President and Editor-in-Chief.)

"A couple of years ago, we wanted to do some field testing, but scheduling wouldn't allow it. It takes too much time and we wouldn't have gotten the books out. It wasn't a question of money, but just scheduling. We're now working on a program we plan to field-test. I hope we can. Testing has lots of problems, you know.

(This company has no information on field-testing available to schools.)

(Company B, Editor-in-Chief.)

"We don't do any real testing from the standpoint of content or pedagogy. When I was Editor-in-Chief at —, we did a lot of testing, but we were testing the format, you might say. We found that some difficult-to-product stuff wasn't necessary. This is the kind of testing most publishers do; it can lead to some improvements from the teaching standpoint, but that's just serendipity.

"More testing is needed, but it costs a lot. When I was teaching, I always wanted to know about classroom trials, but I never got any information." He concluded with:

"Publishers usually claim materials have been 'clasroom tested' or 'used with thousands of students throughout the country,' but no one should call what they do 'testing.' "

(This company has no information on field-testing available to schools.)

(Company C, Senior Vice President, Editorial.)

"We have about one hundred and sixty salesmen and consultants who report back what they pick up in the field; that's really our field-testing."

[He then described some testing of the company's reading program.] . . . "It involved only about twenty-five or thirty kids, but you know if you can find that eight out of ten kids don't like a certain selection, you really don't have to go further; I know this isn't how test people work but it's unlikely that you're going to be too far off. . ."

"In high school American History, I think we got feedback from fifteen schools . . . [but] . . . teachers don't ask us how we know the books will work . . . I don't foresee any trend toward more field testing or evaluation. The 1970's will see, I feel, a contest between the 'Silberman Camp' and 'performance contracts' . . . [Albert] Shanker made a good comment in the Times recently and I'll go along with his position. I don't understand what's going on in Washington these days. And I sure as hell would like to know what the hell the National Institute for Education is up to."

(This company has some field-test results available.)

(Company D, Vice President and Editor-in-Chief)

". . . mostly we depend on what we hear from people out in the field . . . Sure, field-testing is good, but it can be overdone . . . Some of the government-funded projects are needlessly complicated . . . They do their own material and revise it and revise it . . . Any good editor can do the same thing, just on the basis of his own experience . . . Holt's Biology still sells (this company is *not* Holt) after all the money they [the government] spent on the BSCS materials . . . We didn't test — or — and they're still among the best sellers we have."

(This company's field-test information is for its own use only. We were told that if a school wants information on field-testing and the adoption is important enough, an appropriate editor will write a letter.)

In addition to this telephone survey, EPIE also conducted an analysis of advertisements for instructional materials that appeared in 13 issues of seven major educational journals and magazines in recent months. In all, EPIE analyzed 344 advertisements, only 17 contained references to any type of field-testing of the product being advertised. An EPIE researcher got in touch with the producers who had placed the advertisements. Only two of them referred our researcher to published research studies; six others said they would be willing to supply information which ranged from informal feedback from class trials to surveys of teacher comments. The producers responsible for the nine remaining advertisements were unable to refer us to (or send to us) any evidence to back up the statements made in their advertising.

In one case, it was quite evident that the producer had no data of any sort, even though his advertisement urged schools to get in touch with any regional office "to learn how well these materials are working in schools like yours" (This is not the exact wording of the advertisement.) A further investigation ascertained that when a school did, in fact, get in touch with a regional office it would first be sent a list of schools in that region which had purchased the materials and then it would receive a visit from a salesman.

This sort of sales strategy is, of course, disturbing. However, in a sense it was even more disturbing to learn that during the months that this advertisement was being intensively run, the company received only five requests for their "field test" information from schools across the country! Sales, nonetheless, were quite satisfactory during the same period.

Point 5.1—The way schools select materials does not encourage producers to create learner-verified materials.

When one examines the ways in which most schools select materials this lack of attention to evidence of effectiveness resulting from learner-verification or field-testing is not surprising.

EPIE learned this in 1969, when it cooperated with eight state education departments in surveying the evaluation practices used by schools and state agencies in the selection of instructional materials and equipment. The project identified and studied materials selection practices in 19 school systems designated by specialists across the country as being more conscientious than many others in this task. In every case, these 19 schools relied almost completely on examination and review of the materials plus (in some cases) discussions with sales representatives. Only occasionally did selection committees use the results of student performance data from pilot tests of the materials conducted in local classrooms. Indeed, one state department of education included in the study strongly recommends local pilot testing of products, but we found little evidence that school systems in the state followed the suggestion.

A recent followup study of the 19 school systems indicates that the practices identified in 1969 are still in use today. However, we were somewhat encouraged

by the fact that one of these systems does press producers for evidence of the learning effectiveness of their products, and that others sometimes seek such evidence. As yet none makes such evidence a purchasing specification.

Point 5.2—Most schools fail to use learner-verification data when selecting materials.

When one remembers that these 19 systems were designated as being more sophisticated than most others in the country in product selection, the nationwide picture remains pretty bleak. Nationally, we must still conclude that most schools fail to employ verification data from learners when selecting curriculum materials.

The reason for this, it would seem, is that in evaluating products, school selection committees must devote most of their limited time to judging a product's content and pedagogical approach. Practically no time can be given to gathering evidence of a material's learning-effectiveness. Committees assume that materials with "good content and the right approach" will, by definition, be effective with learners. Logical as this may sound, it is not necessarily true.

Point 5.3—Research supports use of learner-verification data as essential in product selection.

Fortunately, some research exists which has examined the question of whether it is possible to infer the learning effectiveness of particular examples of instructional materials by simply examining them. This research raises serious doubts about the reliability of the practice of judging the quality of learning effectiveness without the help of learner-verification data.

In the first of such studies a group of teachers and a principal were asked to review and rank, for effectiveness, alternate versions of a set of materials on which evidence of effectiveness with learners had been gathered by the researchers, but was not made available to the educators. With no evidence of effectiveness available to them, the educators were strikingly unsuccessful in judging the learning effectiveness of the materials they had attempted to rank. The correlation between their judgments and the actual performance of the materials with learners was —0.75.

This study is one of few in the literature of educational research that has been replicated and had its results corraborated by a second researcher with a similar group of subjects. Despite this fact, most school men and members of the education industry continue to put their faith solely in examination and review rather than evidence of actual performance when judging educational materials.

Point 5.4—The real problem in schools and industry.

Not just existing research, but common sense, makes it quite clear that at present any responsible effort to create or select materials of proven learning effectiveness must use data from learner-verification. So the problem is not that research does not answer the question directly and unambiguously—*the real problem is that the question of learning effectiveness does not seem to be of great interest to the producers and purchasers of educational materials.* This situation is not the result of collusion or conscious negligence on the part of companies and schools, but rather of habit, apathy and ignorance.

The fact of the matter is this: many producers and purchasers feel they know how to judge the learning effectiveness of materials. Thus, they become defensive when researchers suggest that their methods are less than reliable. Others, as we have seen, simply infer that materials examined and judged acceptable as to content and approach will also produce effective learning.

The problem, then, is one of changing well-established, comfortable behaviors on the part of both producers and purchasers. When such is the problem, it is difficult to change people by pointing to research studies. What then, can be done to change present practices of product development and selection?

The first step is both simple and difficult. It is to admit honestly and candidly that these practices can and must be improved. What must be avoided at all costs is, on the one hand, preaching a counsel of perfection ("Research can't tell us precisely what to do, so let's not change things until it can") and, on the other hand, becoming defensive about established practices ("These practices have been developed and refined through professional experience over the years.).

Point 5.5—A new credo for professionals in schools and in companies.

The credo of all professionals—in the education companies and in schools—must be: "There isn't a product we produce, nor a product now in use, that cannot be improved. Every product must continuously be revised in light of the growing knowledge and the constantly changing needs of learners."

Most producers of materials for young children will eventually be forced to revise their products for youngsters who have been habitues of Sesame Street. This sort of extra-school learning is affecting the performance of every educational material now in the schools.

What is needed is a credo of improvement and accomplishment. In the few instances where this credo has been followed with action, the results indicate that some real progress has been made. Let me cite two examples of the sort of improvement and accomplishment that can be made when a product developer and product user admit that thing can be done differently.

TWO EXAMPLES OF VERIFIED MATERIAL

The first example I have chosen is a thoroughly researched product of a federally-sponsored regional educational laboratory. The second is a product from the commercial textbook field that has been put through a reasonable approximation of learner-tryout over the last two decades.

The new product is the First Year Communications Skills Program developed by the Southwest Regional Laboratory for Educational Research and Development. The program has 10 units designed for use with kindergarten children. The units cover basic communications skills (i.e., naming the letters of the alphabet, reading simple selections). The program takes from 21 to 35 weeks for children to use, depending on the amount of time allocated daily. The producers state: "The reading skills to be acquired are listed very explicitly throughout the program and their successful mastery is the most important result of the instruction."

This language is similar in tone and content to the language one finds in the commercially-developed materials but the kind of evidence offered by the Southwest Laboratory in support of this statement is hardly, if ever, forthcoming from commercial developers.

The heart of the verification procedures used with these materials is a special kit that has been developed for "Quality Assurance." The contents in this kit are related to: (1) mid-year and end-of-the-year pupil performance, (2) information collection and reporting, (3) schoolwide sampling plan and schedule, (4) data processing, (5) decision rules for selecting alternative courses of action, and (6) guidelines for evaluating program modifications.

Back-up data have been gathered over a four-year cycle of product development during which the units were continuously tried out with learners and accordingly revised. The developers readily admit that criterion mastery was not achieved when the product was first used with children. But now, after four years of continuous evaluation and revision, this mastery has been verified through use with more than 30,000 children in 12 states in middle sized schools and several large urban districts. These materials will eventually be commercially distributed.

The inclusion in the Southern Regional Laboratory's kit of a set of guidelines for evaluating program modifications prompts me to comment on a study which should be of particular interest to this Committee. It was recently brought to my attention by an educational researcher who discovered it in the process of preparing a review of research on the nature of product development. The study was conducted by the Department of Defense under the title of Project Hindsight.

Point 6.1—D. o D. study indicates that cost-effectiveness of technical systems are frequently improved thru a minor modification in one component or function.

The relevant finding of Project Hindsight was that when researchers conducted a retrospective examination and analysis of the functioning of a technological system they were frequently able to identify a critical part or function that could be modified at very little cost. When the identified function was, in fact, modified as a result of this "hindsight" it was discovered that this low order modification of the single variable frequently resulted in very high order improvements in the overall effectiveness of the system.

In my opinion, it is not unlikely that the use of specific feedback from learners on critical variables during the revision process will make it possible for producers to realize comparable improvements in the overall effectiveness of specific educational materials.

My second example, a traditional enough looking textbook, was first published more than 20 years ago; yet it continues to outsell all other texts in its field. It is an introduction to economics created by Professor Paul Samuelson of M.I.T. as a freshman college text, but it is also used in a few senior high school classes.

Since the first edition was published in 1948, seven subsequent editions have appeared and an eighth is scheduled. Each edition has gone through a three or four-year revision cycle in order to update content, organization and style of presentation—geared to increasing the effectiveness as well as the sales of the material.

To prepare for each revision, the developer gathers information from both teachers and students regarding the teaching-learning effectiveness and acceptability of the test. The author has informed EPIE that a sampling of institutions using the text is selected and questionnaires are distributed to students who have used it.

The questionnaires are returned directly to the author for analysis and use in revising the text. In addition to this tri-annual feedback from students the author continuously monitors the use of the materials with a small group of lower-than-average students taught by another professor at a nearby university.

If the committee wonders why I have selected this college text as my second example rather than one of the 14,000 elementary and secondary texts now on the market, it is because in four years of research EPIE has failed to identify one of the more than 14,000 texts which has been continuously and systematically revised over the years in a fashion comparable to that used by Professor Samuelson in revising his economics textbook.

Point 6.2—All materials should be regularly revised using learner-verification data.

From the standpoint of the relative size of the college and elementary-high school markets there is no reason why elementary and high school textbooks and other materials as well cannot be revised in this manner. There is also no reason why learner feedback at these lower educational levels could not involve actual measures of learning effectiveness resulting from student testing. Whereas, at the college level, the use of student questionnaires requesting information about what they learned and failed to learn from the text is probably a justifiable alternative to such testing.

Today, there is a growing tendency within the education industry and schools alike to play down textbooks in favor of more complex multimedia instructional systems. This movement is, in part, motivated by the belief that various effects which can be achieved by film, television, and sound and video tapes are educationally desirable. (It is also true that media systems and kits often command higher prices and larger profit margins.)

Point 6.3—Effectiveness often sacrificed for new effects.

The result is that schools often end up spending more money for a multiplicity of effects they may not need, but can easily buy, than for learner-effectiveness they cannot afford to do without.

Research to date indicates that no one medium is always more effective than any other. This evidence has helped to produce the current trend toward using a multiplicity of media. However, such multi-media systems may prove, in many cases to be a totally unnecessary brandishing of technology.

Buckminster Fuller characterizes the achievement of technology as "doing more with less." I suggest that—given the phenomenal growth and uncritical acceptance of all types of educational materials—that it just may be that we are "doing less with more!" The kind of research and development being planned for the National Institute of Education could help us find out just what we are doing. Without such systematic efforts we will continue to fly blind.

One example of such blind flying is in order. Recently a new multimedia course in elementary economics was developed for the U.S. Naval Academy by a private contractor. The course materials included programmed books, nonprogrammed printed materials, films, computer simulations and manuals, audio cassettes and student response devices. Materials for each student cost approximately $100, not including the amortized cost of the films and computer simulations (the eleven simulation manuals cost an average of $3.50 each). Despite the availability of all these media, the majority of students opted for learning from the programmed books alone. Almost half said the films were boring and a waste of time. The programed materials were learner-verified; the films were not.

The Naval Academy investment in this single course has been substantial ($643,020) and the continuing per student cost is by no means small. The Naval Academy might well ask two questions: Is the multiplicity of media really necessary or simply an example of technological overkill? How well do these course materials, costing approximately $100 per student, compare with Professor Samuelson's textbook costing a small fraction of that amount?

One thing is certain: We cannot afford the luxury of being encouraged by the two examples I have cited—or by the few others I could have used. We must not forget that an estimated 99 percent of the materials now being sold to schools have not been developed in this fashion. The fact to remember is that the 200,000 plus educational materials represented by that 99 percent will not suddely disappear from schools, nor will they be taken off the market by their producers. Many of these materials are far from worthless, but all of them are far from being as good as they could be—indeed, must be—if they are to meet education's new needs. If, for instance, they were designed with no "target learners" in mind then there is an urgent need to discover with which learners they are most effective—and on which learners they are lost. These are persistent, unanswered questions that must be dealt with, if the ultimated educational consumer—the learner—is to be served. Schools must have materials that meet the needs of all our children—and that meet them as individually as possible.

Point 6.4—Yesterday's tools are not good enough.

As they now stand, the materials schools use are not good enough to meet this need, nor are they good enough to expect our teachers willingly to be held accountable for what students fail to learn when required to use those materials. Schools give students and teachers yesterday's tools and expect them to prepare our society for tomorrow. If the response of both is increasing unrest, should we be surprised? The time to retool education is now—before a revived economy and a less cautious Congress make educational money once again easy to come by.

Unless action is taken new, schools will inevitably spend the money they receive for what is available, in other words for the unimproved materials they are now using. What specifically should be done?

RECOMMENDATIONS

Point 7.1—Need for National Institute.

First, a National Institute of Education is needed to institutionalize a continuing broad-based research program into the many problems surrounding the development, evaluation, selection and use of educational products. This program should place great emphasis on the need to improve materials via learner-verification. It also must try to discover other means of improving the effectiveness of educational materials.

Had a National Institute of Education with such a charge been established as part of the National Defense Education Act in 1958 or as part of the Elementary and Secondary Education Act in 1964, there would be no need for me to be here. But time, money and learning are being wasted. We must improve the tools which 50 million learners and two million teachers are required to use.

Point 7.2—Need for realistic guidelines for producers and schools.

The first task of the National Institute of Education in such a program should be the development and dissemination of realistic guidelines to help product developers institute a program of verification and revision. These guidelines would be aimed at both commercial and noncommercial product developers.

A second set of guidelines should also be developed to assist the schools in selecting materials. Here too, great emphasis would be put on guiding schools to the purchase of only learners-verified materials. These guidelines would not eliminate the need for independent product evaluations, but they could help create a set of minimum standards to be used by independent product evaluators.

By emphasising that these guidelines be realistic, I mean that they must contain realistic recommendations and make realistic demands. The guidelines put forth for the development and selection of programed instruction materials in 1963 by a joint committee of three well-meaning professional associations were not realistic. Those guidelines mistakenly counseled perfection and advocated a single route to that perfection. Needless to say, the guidelines had little effect.

Educational producers, educational practitioners, and for that matter, educational researchers are not perfect—but they all can improve. Thus, the guidelines envisioned here are guidelines that would be implementable by any producer or any school wishing to improve present practice. And they would be realistic enough to offer a number of routes to achieving improvement; i.e., modest products could be evaluated modestly, and more complex and more expensive products more ambitiously. Products such as total reading programs or entire K–12 curriculum programs would receive thorough, continuous learner verification on a much larger scale—with great attention to the task of adopting these major programs to the changing needs of learners.

The specific mechanism for formulating these guidelines would be an NIE Technical Task Force made up of NIE staff and representative groups of specialists in product verification. Such specialists employed in the education industry should be invited to participate as individuals.

The working assumption of this Task Force should be: that all educational materials (with the exception of those not designed for the teaching and learning of specific instructional objective; i.e., fiction, biographies, general background or enrichment materials in book or nonbook media) should be continuously revised using data from learner-verification.

The guidelines for schools should help purchasers make maximum and efficient use of verification evidence, and should urge schools to refuse to purchase nonverified materials.

If this NIE Task Force cannot be formed under the aegis of NIE this year, then an interim task force should be formed which could work under NIE when it becomes established. EPIE would be happy to serve as a vehicle for this task force.

Once these guidelines have been developed and disseminated, producers would be expected to comply with them within a specified period of time. At the end of that period, each producer would be expected to publish a statement of learner-verification evidence for each of his products.

Obviously, it is going to cost producers money as well as time to comply with the proposed guidelines. Producers will have a new item to add to their product development budgets: the cost of gathering and using feedback from learners. Sad to say, this will be a totally new experience for most producers. This increased cost must inevitably increase the costs of materials to schools. But continuously improved learner-verified materials must in the long run reduce many important nondollar costs that are now being passed on to the ultimate educational consumer—the learner.

Point 7.3—Federal aid for the support of learner-verified materials.

If these increased dollar costs are too great for producers and purchasers to absorb, then Federal aid might be offered. Federal aid to producers could take the form of research and development grants to be used to improve specific materials through verification and revision. Federal aid to schools could be in the form of increased Federal funds for school systems that use the proposed guidelines and institute purchasing policies that clearly demand learner verified materials. The outcome of such strategically-managed Federal funding would be to drive out stagnant, unimproved materials and provide schools with useful and effective alternatives to what they are now using.

But until such a system is instituted, schools should do two things: press producers to supply evidence of the learning effectiveness of their materials and indicate their willingness to serve as sites for learner-verification studies.

Point 7.4—Education companies and school boards share the responsibility for continued use of unimproved materials.

Until such time as these recommendations, or a reasonable facsimile of them are adopted, educational companies that fail to conduct evaluations during the development and revision of a product and school boards that fail to demand proof of such evaluations share the responsibility for putting unproven learning materials into the hands of teachers and students.

I repeat my contention that this situation is the result more of habit, apathy, and ignorance than of collusion or negligence on the part of companies and schools, but I also state that Now is the time to change the habits that have created the present situation. All parties, the industry, the schools and the Congress must admit to having been ignorant; now they must do what must be done to become wiser. The proposed National Institute could do much to create the knowledge upon which such wisdom depends. Millions of children stand to learn better if we will allow ourselves to create that knowledge and seek that wisdom.

I realize I have said a great deal in this testimony about the need for learner-verification and revision as a means of improving educational materials, and as a means of protecting the learner as the ultimate educational consumer. In closing, I want to make it clear that I have placed this emphasis on learner-verification not because I see it as the only means of improving the effectiveness of educational materials, but because at present it is a thoroughly effective means of improvement at the disposal of both producers and schools—which is largely ignored.

REALIZING THE RADICAL RELATEDNESS OF TECHNOLOGY AND EDUCATION

(By P. Kenneth Komoski, President, Epie Institute, New York, N.Y.)

I am speaking to you out of a deep concern over the ways in which technology and education are related in the world today. This relationship may best be described as a dynamic interaction between two extremely potent forces. The question which concerns me most is how each of these powerful forces is currently shaping the other and, in so doing, is shaping the evolving world. This is an enormously broad question of profound importance. Nevertheless, I shall attempt to cast some light upon it in this brief presentation.

My first theme is that there is an urgent need to fully realize (in the sense of comprehend) the extent to which technology and education are related in the modern world. My second theme is that this relatedness exists at a very deep conceptual level and its practical everyday social and educational implications have hardly begun to be realized (in the sense of being made real). Needless to say, these practical implications are both positive and negative—but more importantly, they are also *unlimited*. At present, there is great difficulty in realizing (both in the sense of comprehending and making real) the implications of this relatedness because of our severely limited conceptualizations of technology and education. These limited conceptualizations have resulted in the widespread failure of educational policy makers, practitioners, and the public at large, to grasp the truly radical implications of the relatedness of technology and education. I shall focus first on our present limited concept of technology.

The most common and most limited of the current conceptualizations of technology is one which equates technology solely with machines. The defining attributes of this machine-centered conceptualization are efficiency and economy achieved through repetitive, standardized activities organized for the purpose of producing a standard, widely applicable result or product. When a person who adheres to this limited concept relates technology to education, he views it as a means of achieving a set of standard educational objectives via standardized techniques of instruction.

A second somewhat less limited conceptualization of technology is one in which technology is viewed as man's means of manipulating the elements of his material environment for the purpose of producing specific, consciously conceived results. When a person with this concept in mind views the relationship of technology and education, he sees little more than the use of various devices, such as film projectors, television, or the manipulation of various environmental elements such as walls, lighting and acoustics in order to achieve a set of educational results.

One reason why these conceptualizations of technology are uncomfortably limiting is their failure to take into account technologies that are neither machine-centered nor concerned solely with the manipulation of material elements of the environment. That is, they fail to make room for the newly emerging biological and behavioral technologies. But even if we enlarge the concept of technology to make room for these emerging technologies, we would only be engaging in a process of redefinition by addition. Whereas, what is urgently needed (if we are ever to comprehend modern technology and its relationship to modern education) is to undertake a fresh approach to the definition of technology built upon that which is *most basic* to all extant technologies—whether they be mechanical, electro-mechanical, electronic, biological or behavioral. What we should be striving for is, in fact, a radical redefinition of technology based on the most essential and common elements of all extant technologies.

Almost ten years ago, Walter Ong, a noted Jesuit scholar in the United States, suggested rather cryptically, that at its most fundamental and essential level "Technology has to do with the ordering of the possessions of the mind." This tantalizing insight into the essence of technology takes us a long way toward the basic understanding of technology that is lacking in the world today.

A second also cryptic, but somewhat more specific insight, which reinforces Father Ong's more general observation, is one by the author of *The Meaning of Meanings*, I. A. Richards, who has commented that, "A book is a machine to think with."

If the bibliophile resists thinking of a book as a machine and the scholar rejects the thought that the work of ordering and categorizing knowledge is in the same sense a technological act, then I hope that both may at least grant that *those things that are commonly called machines*—such as the lever, the auto-

mobile, the computer—*may be validly described as human thought and knowledge made tangible.* If one does not simply grant, but is also willing to reflect upon the validity of a broader truth hinted at by Richards and more directly suggested by Ong, becomes clearly apparent. The first step in this realization is to grasp the idea that, even though when built, a machine is an orderly arrangement of material elements activated by the application of energy, before it could be built the machine had to have taken the form of a well-ordered set of thoughts in the mind of its inventor.

If this is so, then a book with its ordered set of pages, its ordered tables of contents and index, may, indeed, be thought of as a special type of machine, or, in Richards' words, "a machine to think with". And if one can see the truth of Richards' insight, then he may also begin to appreciate the validity of Ong's sweeping observation that in its most basic sense, "Technology has to do with the ordering of the possessions of the mind". Once we grasp and accept the idea that *human thought—rather than physical matter*—is the true *raw material* of technology, we are now in a position to grasp and explore what I have called in the title of this paper, "the radical relatedness of technology and education".

This relatedness is rooted, first and foremost, in the fact that both technology and education are uniquely human activities. (This is not to say other animals are incapable of manipulating their environments or learning to adapt to a changing environment—it is just that the human animal is so much more capable.) *Technology, it would seem, is the sum total of those activities which, in the aggregate, enable man to carry out almost any imaginable manipulation or modification of his external (material) or internal (behavioral) environments.* Education is, of necessity, closely related to technology in that it is made up of those activities through which men are able to transmit to one another knowledge of how to manage and adapt to the changes within these environments. Of course, education should and *must* do more than this, but to the extent that it is concerned with these tasks of environmental management and adaptation, both the content and processes of education must inevitably relate to technology. This is particularly true as man's environment becomes increasingly technological. In short, the relationship of technology and education is, today, so close that in many parts of the world educational institutions are in the process of becoming little more than hand maidens of a demanding, world-wide technological master. This is readily understandable in a world in which technology keeps creating so much for us to know and our educational systems are so caught up in the task of transmitting this technologically-generated knowledge, that they are failing, among other things, to teach us that technology itself is a human-generated force. These educational systems also fail to take into account that while both technology and education are, indeed, human-generated, neither of them, today, are primarily human-centered activities. Rather, they both tend to center on the development of themselves as systems.

To the extent that this tendency grows, we are succeeding in creating a closed technological-educational system. A system which is all too capable of measuring its success in terms of how well it functions not as a means to larger human ends, but in terms of *the system as an end in itself.* Let me give a concrete historical example of what I mean by this general and abstract statement.

During the early years of the industrial revolution in Great Britain and the United States, there was a great drive to educate large numbers of the population, at least to the basic level of proficiency in the fundamentals of reading, writing and computation, and to provide them while still young with what was then called "moral instruction". In order to facilitate the transmission of the learning contained in their curriculum, special buildings were built capable of containing the large numbers of learners who were to be instructed by a much smaller number of teachers. A system of instruction was developed which could be used by the teachers to instruct the learners in an orderly fashion. The system used books in which what was to be learned was, in turn, organized according to the system which the teacher was using. (Or, as was frequently the case, the teacher followed the instructional system implicit in the organization of the book.) The avowed purpose of this well-ordered system was, as we have already noted, to facilitate learning. And at first there was no question that this was indeed its stated and actual objective. One very important measure of this is the fact that in the earliest and most famous of the early mass-instructional systems (developed by Joseph Lancaster in England in 1801 and in use in North and South America, the European continent and Turkey by 1820) while instruction

was conducted in groups, individual students were able to move from group to group based on their proven mastery of the curriculum.

Gradually in these systems, this primary objective slowly became a secondary consideration. The main consideration became the maintenance and growth of the system itself. An excellent measure of this is the fact that as these systems grew, individual students were less and less frequently allowed to move ahead of their group even though they may have mastered that portion of the curriculum. An even greater measure of this is the fact that students who had not mastered a particular level of the curriculum would be indiscriminately moved ahead with the group to which they had been assigned. It is difficult to find any mass-instructional system developed during the 19th Century which did not lose sight of its original human-centered concern for the eradication of ignorance, and which did not make the concern for the continuation and growth of its own existence its primary goal. We have here the classic case of a technological undertaking which was designed with the best of possible human motivations unconsciously transmuted into a mindless ordering of lives by a mindless and eventually unproductive system. One may be tempted to say that this devolution of 19th Century mass instructional systems from their initial human-centered concerns to their eventual self-centered machinistic concerns is simply the nature of any bureaucratic-like organization.

In fact, if I read Jacques Ellul's *The Technological Society* correctly, I believe he is maintaining that this type of devolution is an inevitability whenever men organize their activities on any scale. However, I think it would be too bad to uncritically accept Ellul's unqualified pessimism when it comes to the question of inevitability in technology. Therefore, let us adopt for the moment the posture of qualified optimists and take a critical yet more constructive look at the interaction of technology and education *I suggest that this look should be taken on as broad a scale as possible—from the beginnings of mass instruction, mass production techniques to the present. If technology has to do with the ordering of the possessions of men's minds, then I maintain that such a sweeping look might suggest to us that for two centuries technology, itself, has, in fact, been a gigantic teaching machine!*

Were we to accept this insight, we might conclude that given the growth of the factory system, with its mass production and assembly line techniques, with its routinized use of human beings, that it taught educators more powerfully than any educational theorist could have—those things needed to be learned by the members of an adolescent industrial society. The fact that 19th Century schooling throughout the industrialized world was a highly routinized, individual-constraining experience, is not something that can be considered as having developed independently of the industrial models that were so close at hand.

Whether this is a more likely explanation of the character of 19th Century schooling than the theory that any large scale bureaucracy will inevitably take on these characteristics is difficult to prove. However, it may become a moot point if we look at more recent developments of the interaction of technology and education.

But before we do this, let me restate the case for the "teaching machine" view of 19th Century industrial technology as forcefully as I can. If viewed as a gigantic teaching machine, the lesson taught by the 19th Century industrial technology seems to have been that the human being was not so much valuable in and of himself as he was a component within and a willing consumer of the results of industrial production. As a result, this view of the individual was mindlessly, subtly and effectively programed into both the formal and informal educational systems of the day. Too often the goal of this technologically dominated educational message became unconscious acceptance of the idea that the manipulation of man's natural resources, via technological means, was a totally desirable and unquestionable social and economic good. In time, the pervasive, persuasive teaching machine of technology began to order the possessions of men's minds so as to accept and expect that they, too, would, and indeed, should be so manipulated. Thus, a major lesson taught by 19th Century industrial technology was that if the individual wanted the benefits of modern industrialism in the form of material well-being, he would unwittingly allow his mind and behavior to be ordered in ways compatable with the technological ordering that had made industrialism work. In short, if the individual wished to benefit materially from modern industrial technology, he had no choice but to gear his life to the mass-production mass-instruction system on which the 19th Century technology was based.

Today in the second half of the 20th Century, we may observe, particularly in the more industrially advanced countries, increasing numbers of individuals who feel that there are alternatives available to them other than the gearing of their lives to what they consider an outmoded system of production and instruction. Granted that even during the depths of individual-degrading Dickensian type of mid-19th Century industrialism, there were individuals who "opted out" of the system, for individuality always manages to assert itself through the spirit of a few personalities. But the appearance of increasingly larger numbers of such individuals is a unique mid-20th Century phenomenon. The question of why and how this phenomenon has come about is being asked and answered by many different people in many different ways. Let us here attempt to answer it from the "technology-as-teaching-machine" point of view. We have already established that as one looks beyond the essential, mind-ordering characteristic of technology, the less essential attributes which help to define it for us at a particular point in time do, in fact, change over a period of time. This being the case, it is important for us to return to the examination of the changes that have occurred within the defining attributes of technology during this century.

We have previously noted that since the beginning of the century the attribute of behavioral modification or manipulation has been added to and has extended the definition of technology beyond its earlier, more restricted, material-based limits. We have also discovered that this extension is, through a process of implication, destroying the even earlier, even more restrictive definition of technology only in terms of machines. However, I would suggest that from the standpoint of education in general, and in particular from the viewpoint of technology as a world-wide teaching machine, there have been even more important changes among the attributes which define technology in the third quarter of the 20th Century.

The most significant among these new defining attributes was the appearance earlier in this century of what I shall call "optionization" and "immediacy." "Optionization" made its appearance as a new attribute of technology initially among a few industries in the U.S. at the beginning of the second quarter of the 20th Century. The "attribute of immediacy" entered the scene somewhat later. Some of the earliest and most dramatic examples of the emergence of optionization came in the automotive industry in the form of a shift by auto producers and auto buyers away from the production and popularity of cars, like Henry Ford's famous—and highly standardized—Model T automobile, (which as Ford put it: The customer could have in any colour "as long as it's black!") toward the production and purchase of automobiles with broader and broader options, ranging from varieties and an array of performance features to the choice of almost any colour imaginable. "Immediacy" was introduced most dramatically through the development and use of media of communications that make information *immediately* available to the individual—*at his option*.

Today during the third quarter of the 20th Century, "optionization" and "immediacy" have become increasingly central to the changing concept of technology. Within the world's more highly industrialized countries both "optionization" and "immediacy" have pervaded almost every area of consumer goods and services. No longer does a single standardized product, whether it be shoes, breakfast cereals, or automobiles, satisfy consumer demands. Nor are services such as education or communication considered satisfactory unless there are a significant number of available alternatives, and unless these are available *immediately*. Parallel to this 20th Century shift from *standardization* to *optionization* is the somewhat less obvious but potentially more important shift from an unquestioned willingness to a determined unwillingness on the part of the individuals to gear their lives to the traditional industrial and educational systems. The most important fact about this shift—which in the United States is currently and *most significantly* referred to as "opting out"—is that it is, in fact, not a future *hope*, but an *immediate* grasping of an optional life style for large numbers of young people. The second important fact is that this option and the immediacy of its availability exists *solely* because of the highly productive level to which industrial technology has risen during this century.

Without having achieved this level of productivity and the concomitant level of affluence it has generated, no substantial number of people in society could "opt out" and manage to have themselves or society survive. The significance in the slang expression "opting out" is the unconscious recognition that it is the workings of modern technology itself which is teaching that it is realistically possible from an economic standpoint as well as often desirable from a purely human standpoint to "opt out" of the present system.

The giant, mindless, unconsciously programed teaching machine of modern technology has been quietly and unconsciously at work—teaching the young. It has been teaching them that it is possible to step outside the working world of our more advanced technological society and manage to live well enough on the material effluence which surrounds the technological mainstream. The Ellulian, or unqualified pessimist's view of this situation might well conclude that what these young people are inevitably opting *for* is a parasitic existence at the expense of the society's more responsible technologically engaged members. And, of course, there is always the chance that this diagnosis is correct.

But let *us*, for a moment longer, maintain our assumed posture of qualified optimists and look for possible signs of other, more positive outcomes. In fact, let us go one step further in our role-playing and assume the posture of an "opt-out".

You are now the member of that small but growing group who have taken the initiative and taken for *themselves* the prize that the Technocrats and the Marxists have long implied they would win for the common man—the prize of being supported by a man-made, but technologically managed system of production.

But *you* have not waited for the technocratic state to award you this prize. You have grasped it—ahead of schedule, as it were—and are confronted with the question of what you will do, now that you have it. I suggest that there is a chance that you will not begin to live in a parasitic, apathetic way—that there is a chance that for the first time in your life you will begin to realize how much waste is tolerated, accepted, even expected in a technologically permeated world. You find that you have time to think about this—to reflect on it, and even to actively respond to the waste and to the social inequity implicit in that waste. In short, there is a chance that as an "opt-out" you and your fellow "opt-outs" will come to view yourselves as actively performing the function of a social conscience for those members of society who are still so directly involved in maintaining the system that they cannot, or dare not, see its faults.

There is also the chance that in performing this rôle as an *active* social conscience, you may find yourself reflecting on two facts of your new life:

(1) That it is, in fact, modern technological society that makes your life possible, and,

(2) That you are one of the first few who have managed to learn the major lesson being taught by the big teaching machine—that it is possible to maintain a socially relevant, human-centered existence in the midst of a technological society by persuasively demanding that the traditional technological system be adapted to serve the human and material needs of *all* members of society.

If you reflect upon these two facts, and wish to act, you will then be faced with the practical task of forcing the present techno-centered system of education to develop more human-centered techniques. If you don't become actively involved in this social and technological revolution, you and your fellow "opt-outs" may no longer have the option of keeping the prize you have grasped. What then can you as an "opt-out" hope to do that is likely to keep this from happening? What can you do to protect the life which technology made it possible for you to choose, but which a self-aggrandizing technological system threatens to take from you? Let me give you some concrete examples of what is, in fact, being done today in some communities in the U.S. by some small groups of socially involved learners and teachers.

In Milwaukee, Wisconsin, students from both municipal and private schools have "opted out" of this traditional education and formed their own schools. They hire their teachers, and are accepted into the best colleges.

In New York City, a school which was formed three years ago to help children who have been rejected by public education is this year being overwhelmed by applications from students who are performing well in the traditional system, but who feel that the system does not provide them with the type of learning options they desire. By a teaching-learning process which uses teachers, innovative teaching materials, and cooperating professionals from the community, students in this school are able to study in a completely individualized program while actually working with practicing professionals. The students in this school are paid for the work they do.

In Philadelphia, Pennsylvania, the traditional school system has developed a similar learning program as an experimental "counter-system" of education. This program, which has been highly successful, amounts to a planned revolution that may radically change existing educational practice and thought.

But let us not miss the point, the significance, and the radical justification of what is going in in these revolutionary situations: The point is that students themselves have generated these schools; the significance is that such student action has been prompted by the fact that, *in their opinion*, they were not being serviced by the traditional mass-instruction, mass production system; the justification of what is going on here is a conscious shift from the threat of the "dulling standardization" of the existing technologically-controlled system to an emphasis on the stimulating thrust of "optionization" within an evolving technological society. Putting all this in another simpler way: Educators view technology *as it has existed;* students (at least some of them) see technology *as it is coming to exist!*

The question is, then, how can you as an educator bridge this perceptual, conceptual, generation gap?

The first thing that you do is to become fully aware of the radical nature of the relationship between technology and education. By this I mean that you must come to realize at how fundamental a level the human-generated forces of technology and education are inextricably intertwined in the contemporary world. Having realized this, you must do what you can to make others aware of this radical relationship and aware, also, of the simple, radical truth that, at their related core, both technology and education have to do with the "ordering of the possessions of the mind". It will then be just a small step for you to see that the real educational/technological issue in the world today is how men's minds shall come to be ordered.

Shall they be ordered in such a way as to become the products of a mass-production, mass-instruction system, or shall they be ordered by an alternative system, the central purpose of which is to make the tools of educational technology readily available to each individual and provide him that most precious gift—the time and security within which to pursue the knowledge he *needs* to function as a human being in a technological world.

The achievement of such an objective, which is nothing less than the redirection and management of present technological/educational systems to this human-centered end, is unlikely to occur given the present mindless pursuit of other system-centered ends that pervade the world today. However, if the educational potential implicit in modern technology can be consciously focused on the task of providing individuals with the means of becoming critically aware of the complex task of maintaining human-centered lives within a technological society, there is hope. If this hope seems somehow odd or incestuous—in that it rests on employing technology to teach ourselves how to deal with technology—we must realize that, in a most profound sense, this hope is the same that each of us asserts as he faces the task of using his mind to examine and deal with its own workings and products. My hope, then, is that it is still possible to create human-centered technologically-aided educational systems. And I rest this hope on the chance that educational practitioners, policy-makers, and the general public will begin to realize the profoundly important implications for all humanity residing in what I have termed "the radical relatedness of technology and education".

Were educational systems to be built upon the positive implications of this realization, they would of necessity be systems which centered on developing within the individual an awareness of—and the competence and confidence to deal with—a vast array of learning options from books and other media.

In such a human-centered educational system, students would use technological devices and behaviorally engineered learning materials to acquire a broad range of knowledge. The role of the teacher is no longer that of a human cog processing human products through the machinery of mass-produced instruction. The teacher's role now becomes more human. That is, it becomes the role of helping other human beings achieve the wisdom required to put facts and knowledge to work in maintaining a human-centered way of life.

At the heart of such human-centered system would be the central concern of making the learner aware of the dynamic competition among the teaching and learning systems, the value systems, and the ideologies that have come to characterize the technological world. Furthermore, it would show him the way this competition will unrelentingly affect his own life and the life of the society in which he exists. In other words, it would make him aware of the ways in which technology will affect the ordering of the possessions of his mind! How do we begin to build such educational systems?

The first step is the very practical one of creating "optionized" learning systems which can be used by individual learners with the confidence that what the

system is advertized as teaching will, in fact, be taught and can, in fact, be learned by them. This means that all instructional systems, materials, and equipment must be accompanied by evidence that would justify a learner's investment of time and effort in learning from a particular option. Secondly, there needs to be a very clear explication of the values which are implicitly operating with each learning option. Thirdly, there needs to be very open and very free access to this information so that teachers, students, parents and community groups and policymakers will clearly understand the educational options that are available and how well the various learning materials, vying for the learner's attention, will meet his learning needs.

As I have indicated, attempts to create such systems are currently underway on a very small scale in the United States and other highly industrialized countries. But this does not mean that such attempts need be restricted to technologically sophisticated countries. The opportunity to create human-centered educational systems may in fact be greater in less industrialized countries, where the mass instruction/mass production mentality has not so deeply pervaded the fabric of society. Wherever these attempts are tried, they will meet with the inevitable objections that they are inefficient, in terms of the traditional attributes of a standardized mass-instruction/mass-production educational technology. But in a technological world of increasing optionization, the traditional concept of technological efficiency is—like every other value—now being opened to critical examination and revaluation. I submit that the place to start such critical examination and reevaluation of all the attributes of technology—including familiar attributes such as mechanism, efficiency and standardization as well as newer attributes of optionization and immediacy is within that enterprise to which technology is most radically related. That radically related enterprise is education.

Mr. KOMOSKI. There is an expression that nothing replaces planning. My experience is that nothing replaces serendipity. Coming on the heels of Dr. Gideonse's remarks, I believe what I have to say deals with a special or specific case of the kind of consumer model that he is describing.

I want to point out that the organization I direct, Educational Products Information Exchange, a consumers union for educators, has been conducting very practically oriented research for 4 years into one aspect of the consumer model in education. My conclusion at this point is that at a time of great national concern about consumerism, the most unprotected consumer group in this country is the 50 million schoolchildren, and the 2 million teachers who are required to use learning materials and equipment that have not been adequately developed and evaluated during development in light of what we know about research in education. This is a situation to which I hope the NIE addresses its research program.

I believe that the National Institute for Education must face the very real problem of dealing with educational research in the real world. And the tools of learning that are represented by the materials and equipment now being used in schools, now being marketed by increasing numbers of educational companies must be made better through such research. We need to know more about how to make these tools of learning just as good as they can be. The kind of evaluation that I am speaking about does not just evaluate these tools and give them a certificate of validation in perpetuity. The must continually be evaluated and re-evaluated because the ground of education is constantly shifting underneath the tools that are being used.

An example: If you or I, Mr. Chairman, had been in the business of creating materials for elementary or preschool children a couple of years ago, we might have developed materials that seemed to work very well with youngsters at that time. However, in the last couple of years Sesame Street has changed the educational ground under

which all materials aimed at the preschooler and the child in the early years of school existed.

While our materials might have been appropriate 3 or 4 years ago and met the needs of youngsters at that time, the learnings that children being with them to school today, the kinds of attitudes they have toward the materials they are asked to use have been changed considerably by Sesame Street. Therefore, there must be an ongoing program of evaluation research in the day-to-day use of all kinds of materials, equipment and systems that discovers and adapts materials to these changes.

Now to give you some idea of the size of this problem: I would like to point out that 20 years ago there was basically one catalog that summarized most of the educational materials on the market. It was R. R. Bowker's "American Educational Catalog," and it contained a listing of about 5,000 textbooks, basically printed materials and perhaps another 5,000 of nonprint materials. That was in 1951.

Here we are 20 years later Bowker & Co., publishes what is now called "Textbooks in Print" as well as a number of other catalogs of films and other nonprint materials. I have looked at these catalogs rather carefully in the last couple of months, totaled the materials in them. Bowker now lists something like 156,000 materials as opposed to the approximately 10,000 you had 20 years ago. But their catalog's not complete.

The Westinghouse Learning Corp., came out with a similar set of catalogs last year. Their seven volumes list over 200,000 materials. But that catalog is not complete either. My research indicates that there are conservatively a quarter of a million different materials now used in schools. At EPIE we estimate that about 99 percent of these materials have not been through the kind of developmental evaluation that will improve the performance of instructional materials and enable schools to put better learning tools into the hands of children and teachers.

Let me just get into those figures a bit. The current issue of "Textbooks in Print" lists about 14,000 textbooks. The publisher of the catalog says that there are in addition to the 14,000 textbooks about 56,000 supportive supplemental materials. FPIE has done an analysis of what might be called the best sellers of those 14,000 textbooks.

There are about 60 of these best sellers. Of the 60, about 10 percent have been through what the publisher claims to be field testing. If you look more closely at this so-called field testing you will see that in many cases the kind of field testing referred to is feedback from salesmen.

There is no data gathered from the actual learners who have to cope with the materials. The phrase I use to indicate what ought to be done to improve these materials is a learner verification. The children and teachers of this country should have learner-verified materials. These are materials that are constantly being shaped by feedback from learners. The program of the NIE should draw great attention to the fact that any learning tool put into the hands of students and teachers be verified as being successful with that kind of learner.

If you look at those best sellers again from the standpoint of actual learner verification, the percentage that has been developed using feedback from learners is minuscule. If you look at the 50,000

educational films that are now on the market, again you will find that less than 1 percent have gone through anything approximating learner verification. Even if you look at the one area of educational materials where one might most expect to find learner verification, programed instruction the picture is not much better. These materials came out of research that showed that in order to create effective learning tools, you tried out the materials with youngsters, you found out where the materials were giving the youngsters trouble and you modified or changed those materials based on that feedback.

As part of my research I have done an analysis of programed instruction materials, which by definition are supposed to be produced using learner verification. This is a report which summarizes in tabular form the kind of field testing or learner verification that goes on in program instruction.

If you look at that right-hand column, Mr. Chairman, page after page will show you that since 1961, when the first of these materials appeared, the commercial producers of the materials have not made much use of the learner verification procedure.

The late Robert Locke, executive vice president of the McGraw-Hill Book Co., wrote an article for the Saturday Review recently entitled "Has the Education Industry Lost Its Nerve?" In it he pointed out the great potential of the education industry to apply research findings to the development of learning materials.

I agree entirely with what he had to say regarding the great potential of that industry to apply what is known, but the question is: "Why don't they do it?" We do need to know more about how to create better materials. There does need to be a program of longitudinal research that can be supplied by NIE which constantly examines ways to create better materials. But great improvements could be made, if high priority were given to improved learning effectiveness.

If there were this kind of priority, the education industry might begin to fulfill its potential. If you look at what is going on in the industry today regarding the learner verification of materials, the picture is really discouraging.

I have in my written testimony some quotations from vice presidents and editors in chief of major publishing companies now active in the field. We interviewed them by telephone asking them what their attitude was toward field testing, and what sorts of field testing they engaged in. I will read verbatim. This is the vice president and editor in chief of a major company.

> A couple of years ago, we wanted to do some field testing, but scheduling wouldn't allow it * * * It takes too much time and we wouldn't have gotten the books out * * * It wasn't a question of money, but just scheduling. We're now working on a program we plan to field test. I hope we can * * * Testing has lots of problems, you know * * *

This company has no information at all that it can supply to schools on how well its materials work with particular learners.

This is an editor in chief of another major company.

> We don't do any real testing from the standpoint of content or pedagogy * * * When I was Editor-in-Chief at ———, we did a lot of testing * * *, but we were testing the format, you might say * * * We found that some difficult-to-produce stuff wasn't necessary * * * This is the kind of testing most publisher do; it can lead to some improvements from the teaching standpoint, but that's just serendipity.

More testing is needed, but it costs a lot * * * When I was teaching, I always wanted to know about classroom trials, but I never got any information.

He concluded with:

Publishers usually claim materials have been "classroom tested" or "used with thousands of students throughout the country," but no one should call what they do "testing."

The next comes from a senior vice president, editorial.

We have about one hundred and sixty salesmen and consultants who report back what they pick up in the field; that's really our field testing.

In high school American History, I think we got feedback from fifteen schools * * * (but) * * * teachers don't ask us how we know the books will work * * * I don't foresee any trend toward more field testing or evaluation. The 1970's will see, I feel, a contest between the "Silberman Camp" and "performance contracts" * * * (Albert) Shanker made a good comment in the Times recently and I'll go along with his position. I don't understand what's going on in Washington these days * * * And I sure as hell would like to know what the hell the National Institute for Education is up to.

Lastly, a vice president and editor-in-chief.

* * * mostly we depend on what we hear from people out in the field * * * Sure, field testing is good, but it can be overdone * * * Some of the government-funded projects are needlessly complicated * * * They do their own material and revise it and revise it * * * Any good editor can do the same thing, just on the basis of his own experience * * * Holt's Biology still sells—

It has been around for 40 years and has been essentially revised. That is my comment.

(This company is *not* Holt) after all the money they (the government) spent on the BSCS materials * * * We didn't test — or — and they're still among the best sellers we have.

In addition to this telephone survey we did an analysis of advertising of educational companies and we analyzed about 344 ads that have appeared in education publications in recent months. In 17 of these ads the companies claimed their materials had been tested with learners. We pressed these companies for proof of these claims. Only two were able to supply any information that offered concrete evidence that the materials had been learner-verified. Six companies said, "well, we think we we can get you something if you really want it." The nine remaining companies had absolutely no evidence at all that the claims that they were making were true.

Now why is this so? It is so because on the side of the education industry and on the side of what I have to call the educational consumer, the school buyer (who, in fact, is not the ultimate educational consumer—the learner) there is very little attention given to the effectiveness of learning materials. Furthermore, the teacher, who is the next-to-ultimate-consumer frequently has very little say about the materials being used.

Both sides tend to concentrate on whether materials are the latest approach to the subject matter, whether the content is good. These are certainly valid concerns but too often the learner is shortchanged. At a time when we are saying on the one hand what we want in education is more individualized, more independent learning, and on the other hand that the teacher has got to be held more accountable for student learning, ultimately it is the student who is going to be held accountable.

At the time when these two trends are going on there is a terribly weak link in the system: the tools the learner and the person closest to him are required to use are just not as good as they must be in order to carry on a system where students can learn more and more on their own. At present the good teacher is constantly having to shore up the tools that are used in the classroom, and the poorer teacher is depending on less than adequate tools.

A couple of years ago EPIE was asked by eight State education departments, to do an analysis of selection practices in schools throughout the country. We found that in fact the committees that purchase materials for schools were spending most of their time examining such things as content but also such ridiculous things as whether the bindings of the books that are being used, meet specifications that the publishing industry has been regularly complying with for 20 or 30 years.

The thing that was not being looked at over and over again in the selection of these materials was whether or not there is any evidence that the materials really work with learners, whether or not they are capable of assisting a school system in carrying on a program of individualized instruction where independent learning really does take place.

There are in the research literature a couple of studies that looked at the question of whether educators, (teachers, principals, curriculum people) can in fact examine simply materials and judge whether or not these will be effective with learners. This research is one of the few cases in educational research where one study's results have been corroborated. The first research was done by Ernest Rathkopf at Bell Labs who is a specialist in the problems of verbal learning. He created a number of alternative versions of an instructional lesson and asked a group of teachers and principals who were taking a summer course to rank these alternative versions of lessons as to their learning effectiveness. He had already ascertained the effectiveness of each version by certifying them with learners. The result was that in the absence of learner-verification data the educators were unable to judge which versions were effective and which were not.

Mr. BRADEMAS. Could I interrupt you there and put some questions to you on the basis of what you are saying?

Mr. KOMOSKI. Yes.

Mr. BRADEMAS. First let me go to some presuppositions that are unstated in your testimony.

Mr. KOMOSKI. All right.

Mr. BRADEMAS. And put some needling questions to you.

Mr. KOMOSKI. Sure. Go right ahead

Mr. BRADEMAS. First, you have used the phrase, "learner verification," and you have defined "verified" as successful with the learner, and second you have said we need to make these tools just as good as they can be.

Mr. KOMOSKI. Right.

Mr. BRADEMAS. All right. Now let's look beneath those phrases. How do we decide what is "successful with the learner"? How do we verify success? When you say we need to make these tools just as good as they could be, what's good? What's better? What's bad? Who decides

these standards? Whence do they come? How are they communicated to the teacher? How do you enable the learner to feel he has a role? You are complaining that he has no role in judging the effectiveness of the materials used. Why do you single out materials? You have talked almost entirely about the materials and you have said very little about the processes of teaching.

It is almost as if you are suggesting that there are products which, if used, will lead to verifiable success given any teacher and that there are other products which would not lead to success given any teacher. Do you see some of my reservations?

Mr. KOMOSKI. Yes, sir; I do.

Mr. BRADEMAS. How do you respond to those questions?

Mr. KOMOSKI. Well, as I said at the outset, I am really talking this morning to specific area of the general consumer model in education referred to by Dr. Gideonse. That is, I am looking at what I have focused my own research and concerns on over the last decade: the tools of learning. I realize that if we had poor tools in carpentry or in any of the other crafts that there would be some craftsmen who could still do a pretty good job. But I want better tools so that all teachers can do a better job.

Mr. BRADEMAS. I am just trying to get you to define "tools." You seem to define tool as the textbooks or the curriculum course content.

Mr. KOMOSKI. The curriculum materials, yes. Those are the basic tools of learning, all the various artifacts of the curriculum that are brought into a school. Harold Rugg, who was an educational philosopher and activist in the 1920's and 1930's, pointed out in the midst of all the curriculum experimentation that was going on at that time, "Well, for all the philosophizing and developments of statements of curriculum that go on in schools, if you look at the materials that those schools end up using, they in fact dictate the philosophy, the approach to education really operating in those schools."

My feeling is that if the developers of materials would state quite clearly what it is their materials purport to do, and if school systems would look at the materials they are purchasing in terms of the objectives of those materials to see whether those materials fit what they really think they are doing in their classrooms, that they would get a much truer picture of what their school curriculum happens to be. Then, if the materials chosen by a particular school system examined in this way do meet the particular goals of that school system, the next question is—How well do the materials purchased meet those goals?

Mr. BRADEMAS. The most obvious analogy for what is going on now is the performance contract. I am not saying it is good or bad; that is not my point here. I am just trying to understand your approach. You are saying these are the objectives which can, if the following tools are properly used, be achieved.

Mr. KOMOSKI. Yes, and you will get variation because of the kinds of teachers you have and because of the kinds of students you have but schools, if they were using learner feedback, in making decisions about materials could decide then, "Well, these materials really are not right for us and maybe we need materials that our teachers can lean on more or maybe we need materials that are much less structured for our particular teachers." But right now there is not that

kind of feedback, there is not that sort of information flowing in the decisionmaking process.

My feeling is that as you move more and more toward informalism in education that you are going to become more and more dependent on the tools of learning being used. Schools are going to be turning kids loose with materials. I think that inevitable. And that is a good thing. But while you can have schools without walls and you can even have school systems without schools, you cannot conduct an educational program without the tools of learning.

Mr. BRADEMAS. But what concerns me—and I am not being critical—I am really trying to be analytical because I am quite concerned with what you are talking about——

Mr. KOMOSKI. Yes, I understand you.

Mr. BRADEMAS. But you focus so strongly on what you have now defined as the tools, while you give, it seems to me, little attention to the question of the teacher. I should have thought that the attitudes and the techniques and the understanding and the education of those teachers can have an immense impact on what happens to those children no matter how presumably effective the tools are.

Mr. KOMOSKI. If I have in fact given the impression that the only thing that is important in a school is the materials, let me say now that I do not believe that for a minute. What we need to know though is what kinds of materials really work well with what kinds of learners, and the research and evaluation program that should be established in NIE must look at this constantly. It must answer questions such as what sort of match is there between the materials and the teacher and the kind of program that a school is trying to achieve.

Mr. BRADEMAS. So in other words you have in mind a system with several variables in it. You have been addressing yourself to one particular significant variable.

Mr. KOMOSKI. The system we are discussing has an enormous number of variables and I happen to be looking at all the other variables in relation to the tools which are used in the system. It seems to me that if the student is going to spend more and more time on his own, he is going to spend it with something. He is not just going to sit there and assimilate learning out of the air, and it is very important that we know how the other variables that are operating in the learning setting interact with those tools that I believe are going to become more and more critical.

Mr. BRADEMAS. What do you say of the Coleman report findings that, one might say, indicate that neither teachers, tools nor schools make the difference in learning but that what really counts is the kind of family, home and income background from which the student came?

Mr. KOMOSKI. My response to that is to look at what Dr. Coleman's doing today. What is he devoting a lot of his time to? The development of instructional materials of an entirely new nature built on feedback from learners.

I think what his study points out about the tools of learning is that we have not paid attention to creating tools that students can learn from. If they were given tools that were really aimed at their needs and that enabled them to learn with increasing confidence and independence; that if we would create tools that are matched to the needs of learners, then those tools would show up as contributing signifi-

cantly to learning. I think that Coleman's behavior today indicates that he too believes this.

Mr. BRADEMAS. I think I see more clearly what you are saying. But it would seem to me that if you put such very great stress on the assessment and evaluation of alternative tools on the part of the local teachers and learners, which I think you are doing, which is in line with what Dr. Gideonse was earlier suggesting, then it becomes enormously important, does it not, to ask the following question: How do we educate those who are going to be making the decisions as among alternative tools, just to stick to this particular problem?

I will make an analogy—I don't know if it is fair—to the educational voucher program where it is, it seems to me, assumed that the parents are somehow going to be able to——

Mr. KOMOSKI. Make this wise decision.

Mr. BRADEMAS (continuing). Full blown from the head of Zeus competent to understand that X is better than Y and Y is better than Z school system.

I don't think that is the way human beings are in the real world. How do you propose to educate teachers and learners into competence to make these judgments?

Mr. KOMOSKI. I have tried to deal with that in my written recommendations. I have recommended that a task force is needed to come up with guidelines for producers and schools. The guidelines for the producers would set forth procedures they could follow in learner vertifying their materials. But such guidelines must be very realistic.

There have been guidelines developed before for materials development and they have been unrealistic in the sense that they counseled perfection, and no publisher of instructional materials complied with them. Well, one did for about 6 months but got very little reinforcement.

Now when I say realistic I mean that you don't need an enormous evaluation program for materials that are of a modest nature. As materials become more complex and as you move on to total reading programs, total curriculum programs, I think there needs to be a more sophisticated evaluation of the kind I refer to in my written testimony.

I think when you have full programs you need learner verification of the sort that has been built into the first year basic skills program developed by the southwestern regional laboratory. That program contains a kind of assessment kit developed for use with the materials which enable school systems to assign these materials to learners in the way we were talking about a few minutes ago—matching the materials to the needs of the learner. The kit also provides for feedback from learners to the developers.

Now one hopes that when these materials are produced commercially, that this feedback link will not be broken. It has been broken in other Government-funded projects. Once the materials have turned into the commercial sector there has either been a break or a slowing down of that feedback mechanism so the materials are not constantly being looked at in an effort to make them more effective.

More informal feedback could be used for other more modest materials. I have cited such an example: a textbook, not at the elementary/secondary level, but at the college level. It has been around for 20 years. The textbook is a best seller today and it has been through—

well, it is coming up for its ninth revision now and it has been shaped by learners in the sense that the author Paul Samuelson of MIT——

Mr. BRADEMAS. I assumed that was the one.

Mr. KOMOSKI. Yes; it is by the Paul Samuelson from MIT. But I would like to point out that he was not the Paul Samuelson from MIT 20 years ago when this text was first marketed. But he insisted the publisher gather information from learners on the effectiveness of his text. For instance, he has a class of students at another university that are less able than MIT students. He gathers information from their professor on how well the book is working. He also has students from other colleges respond to a user questionnaire prior to each revision. Certainly that is a big factor but this kind of informal learner verification.

Mr. BRADEMAS. So Samuelson is really an individual model of the kind of process that you are advocating here this morning.

Mr. KOMOSKI. Yes; I would like to see it much more formalized. I would like to see it universal in the elementary and secondary levels where it does not exist at all.

Mr. BRADEMAS. So what we have to do, as I read you, and I harken back to Dr. Gideonse, also, is to build some uneasiness into the producers, to build much more competition into the producers in terms of their having to respond to the criteria of learner verification, to use your phrase. Is that right?

Mr. KOMOSKI. Yes. But the other half of my recommendation has to do with guidelines for the schools because they are not demanding any sort of learner verification evidence.

Mr. BRADEMAS. It is a two-way process: schools have to ask for evidence and the producer has to respond to it.

Mr. KOMOSKI. Yes.

Mr. BRADEMAS. Now you suggest in your recommendations that NIE could help establish such guidelines.

Mr. KOMOSKI. That is right.

Mr. BRADEMAS. You are not suggesting mandatory guidelines, I take it, but rather some research that, if disseminated to consumers, would be helpful to them in making judgments about the verifiable effectiveness of one set of tools as against another set of tools. Is that what you have in mind?

Mr. KOMOSKI. I think that if needed we should have legislation that says that you, as a school purchaser, are not going to be able to spend Federal funds for materials when a producer does not supply any evidence that those materials have been successful with the kinds of learners that he claims they will be successful with.

Mr. BRADEMAS. This reminds me of a fight I have been having with the Department of Defense with respect to the production of Army trucks, and the Defense Department at least on this particular item seems now to be moving toward a procurement process whereby competing contractors will have to build prototype models which the Government will try out to see which one really works. Hopefully, the Government will not have to continue to invest vast sums of money as they have been doing. Very often the Defense Department will put money into something which, you know as well as I do, has never been verified in any way and we lose a great deal of money. Maybe it is a somewhat farfetched model but that is the idea.

Mr. KOMOSKI. In my written testimony, I point to a DOD study which was pointed out to me by a researcher at UCLA, Eva Baker. It is called Project Hindsight and I don't know if you ever heard of it, but the importance of it is that they retrospectively went back and looked at a number of technological systems in terms of performance and looked for what seemed to be critical variables in the performance of those systems. They with very little investment began to, I guest you would call it, tinker around with those particular variables and got enormous improvements in the overall performance of the system.

Now that is the kind of thing that I think can and will happen in the educational materials field if you have this kind of feedback and it is used by the producer.

Mr. BRADEMAS. A final question, Mr. Komoski. We have agreed that the tools are but one of the variables.

Mr. KOMOSKI. Absolutely.

Mr. BRADEMAS. And by tools here you means curricula materials, you mean textbooks, audiovisual aids.

Mr. KOMOSKI. And learning systems.

Mr. BRADEMAS. The whole business.

Mr. KOMOSKI. Right.

Mr. BRADEMAS. Couldn't the same point be made with respect to various methods of educating teachers?

Mr. KOMOSKI. Yes; of course.

Mr. BRADEMAS. In other words, you would say, well, we will try five different ways to produce schoolteachers, several different techniques, processes, and see which one seems to be the most productive. It would be something that would be very complicated to arrange but——

Mr. KOMOSKI. Well, I think my point is that all five might be quite fine, that through learner verification you won't necessarily come up with a best of the five, but you will have some evidence that will enable the consumer to choose which among these five alternatives is best for his needs. Also this learner verification could be used to improve each of those five teacher training programs.

You see, the importance of Samuelson's economics having been tried out on student is not that it is tried out on students and therefore is a good text, it is constantly tried out on students and shaped and reshaped. I return to that earlier point that the educational ground is constantly shifting under every tool that we have out there and we've just got to keep adjusting those tools to the changing needs of learners. You have a much more dynamic society than you had when you were dealing with McGuffey's Reader.

Mr. BRADEMAS. Dr. LaVor, do you have any questions?

Dr. LAVOR. No.

Mr. BRADEMAS. Mr. Komoski, you have been a most stimulating and helpful witness. We appreciate very much your taking the time to be with us.

We shall adjourn until Friday next, when we shall resume testimony on this proposal and hear a number of officials of the Office of Education.

We are adjourned.

(Whereupon, at 12 noon the select subcommittee adjourned, to reconvene on Friday, May 14, 1971.)

TO ESTABLISH A NATIONAL INSTITUTE OF EDUCATION

FRIDAY, MAY 14, 1971

HOUSE OF REPRESENTATIVES,
SELECT SUBCOMMITTEE ON EDUCATION,
OF THE COMMITTEE ON EDUCATION AND LABOR,
Washington, D.C.

The Select Subcommittee on Education met, pursuant to call, at 9:45 a.m., in room 2175, Rayburn House Office Building, Hon. John Brademas (chairman of the subcommittee) presiding.

Present: Representatives Brademas and Quie.

Staff members present: Jack G. Duncan, counsel; Martin LaVor, minority legislative associate; David Lloyd-Jones, professional staff; Gladys Walker, clerk; and Christina Orth, assistant clerk.

Mr. BRADEMAS. The Select Subcommittee on Education will come to order for further consideration of H.R. 33 and H.R. 3606 and related bills, to create a national institute of education.

The Chair might open the hearings this morning by reading a letter which he received last month from the President:

DEAR JOHN: Pat Moynihan has written to me regarding your support of the National Institute of Education.

I want to express my appreciation as a former member of the House Committee on Education and Labor.

I am particularly grateful that your hearings are finally drawing public attention to this much needed initiative in the field of education.

As I noted in my March 1970 Message on Education Reform, ". . . there is only one important question to be asked about education: What do the children learn . . .?" Too many do not learn up to their capacity. The National Institute of Education can be a major force in improving the education of children.

I hope that the Congress will be able to approve this significant new initiative early in the first session of the 92nd Congress.

Sincerely,

RICHARD NIXON.

As our witnesses this morning will be aware, members of this subcommittee and the chairman in particular have been very enthusiastic supporters of what I, in any event, regard as one of the most significant initiatives by an American President in the field of education, at least since I have been a member of this committee.

And one of the reasons that we have been engaged in hearings that may appear to be rather more extensive and intensive than some might have thought necessary, aside from the fact that the House of Representatives tends to go into these matters rather more deeply than do Members of the other body, that this proposal does represent such enormous potential for good for the enterprise of education in our country. So I am especially pleased to welcome to the subcommittee this morning the distinguished witnesses from the Office of Education who are here.

65-510—71——24

I am glad to say that I am acquainted with all of our witnesses and, at least again during my time in Congress, I can think of few groups of top officials of the Office of Education of greater ability and talent and dedication than the group who are here this morning.

I am looking forward to hearing your views.

I regret that it has proved necessary, given the workload in our committee, to schedule the hearings this morning on a Friday when more members could not be here, but, as I think you are better aware than most, there is a whole series of bills before this committee in higher education and child development, to speak only of the educational side, and it is simply not possible for us to schedule all of the hearings during the middle of the week.

That we are meeting on Friday and that there are no more members here should in no way detract from these hearings today, and I will be just as vigorous in my questions as I can, in order to assure you that I am very grateful for your coming.

So, Mr. Davies, we will look forward to hearing from you, sir.

STATEMENT OF DON DAVIES, ACTING DEPUTY COMMISSIONER FOR DEVELOPMENT, OFFICE OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Dr. DAVIES. Thank you very much, Mr. Chairman.

I have a brief statement that I would like to read, and my colleagues also have brief statements about the part of the research program for which they are responsible.

Mr. Chairman and members of the subcommittee, we are happy to be here this morning to discuss the Office of Education's current research and development activities, and their relationship to the National Institute of Education. Let me introduce the members of the panel and make a few general comments. Each panel member is prepared to make a short statement about the research and development activities for which he is responsible. We have tried to keep these brief, in order to have as much time for questions as possible.

The Office of Education administers a great variety of programs which could be loosely termed research and development. Most of these are funded under the Cooperative Research Act. The fiscal year 1972 request under cooperative research is $92.5 million.

That sum will support a great range of activities, from basic research to demonstration, from researcher training to dissemination, from statistical gathering and analysis to program evaluation.

In addition, research and demonstration activities are funded under several other authorities, principally authorities for the Education of the Handicapped Act and the research authority under the Vocational Education Act.

Altogether, our budget office estimates that we are requesting some $172 million for next year for what they call "research and innovative programs." Not all of this can truly be considered research and development; not all would appropriately be handled by the National Institute of Education.

Our first job in preparing the way for the NIE has been to determine which of these functions and funds ought to be shifted to the

NIE, and which ought to remain in the Office of Education. Basically, we have tried to draw the line between research, development, and experimentation (which will be the essential functions of NIE) and program support and implementation (which are properly the responsibility of OE).

Where a program's main task is creating new knowledge or new solutions, it belongs in NIE. When its main thrust is to assist schools today to use tools we already possess, it belongs in OE. The main exception to this principle is decision-oriented research—research with a short-term bearing on operating programs and decisions about them. Any agency needs the flexibility to do some of this work, and OE will retain a small capacity in this area.

Of course, none of these distinctions are quite as simple as they sound, and we have simply tried to make reasonable judgments in areas where those distinctions are blurred.

In the process of establishing the NIE, hard and careful decisions will have to be made about the status of individual projects to be transferred to NIE. Some projects will naturally expire at the end of fiscal year 1972; some will be continued because they fit with NIE's program; some will be continued because strong commitments made should not be broken; and, some will be discontinued. It is impossible to begin making these decisions now—more basic decisions will have to come first. For example, we believe that the NIE director should be hired before decisions on individual projects will be made. At any rate, it is clear that the NIE will have to seek a balance between keeping faith with past commitments and applying its own priorities.

As you know, I have recently been appointed Acting Deputy Commissioner for Development. Commissioner Marland has asked me, as he had asked my predecessor, to assume overall responsibility for the Commissioner's planning for NIE and to chair an internal advisory committee. Dr. Harry Silberman serves as Director of the planning unit.

We now have three full time members of the planning unit in addition to its Director. The group has developed a work plan which establishes a timeframe for the accomplishment of various aspects of the task. The plan has recently been approved, and the unit can now go into full gear on the basis of their plan.

We will be able today to give you more detailed information on the relationship of recent programs to NIE than was supplied by the Secretary and the Commissioner. I hope you will understand, though, that the blueprint for the new agency will take long and careful planning if it is to be done correctly. We expect to keep you informed of our progress as we go along, and we would like to receive input from you during the planning process.

I would like to assure you of my strong personal commitment to the NIE and to express my appreciation to vigorous leadership you are providing in support of improved research and development in education.

That is the conclusion of my statement. If you would like, Dr. Silberman will proceed.

Mr. BRADEMAS. Dr. Silberman.

STATEMENT OF HARRY F. SILBERMAN, ASSOCIATE COMMISSIONER, NATIONAL CENTER FOR EDUCATIONAL RESEARCH AND DEVELOPMENT, OFFICE OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Mr. SILBERMAN. Mr. Chairman, as Dr. Davies mentioned, I serve as Director of the Commissioner's planning unit which has three other members and also lets contracts to outside agencies for the preparation of planning documents.

Funds to the extent of $300,000 have been set aside to enable the planning unit to carry out its task, for the period ending June. This is the first segment of a larger work plan designed to culminate by June 30, 1972, in a collection of documents that would analyze education problem areas, describe relevant resources and provide program alternatives.

These documents worked out in some detail would thus provide guides that could be used by a director of NIE. For example, for each identified area of important educational needs, these documents would consider where are there significant programs addressing this need, what assumptions and methods are being used in analyzing this problem area, how well do these solutions work, how adequately has each program been described, what research questions does it raise, what development remains to be done, what different viewpoints exist as to the most promising R. & D. approaches.

Most importantly, for each problem area, alternative R. & D. programs will be described with detailed cost and time projections accompanied by a discussion of relative advantages and disadvantages of proceeding with each program alternative. The document would also include alternative personnel policies and alternative program management policies for educational R. & D.

The NIE legislation calls for an organization which will be dedicated to the development of radically new alternatives in all phases of American education. The higher status of the NIE within the Government and more flexible staffing arrangements due to relaxed civil service requirements will attract high-quality personnel from many disciplines and professions, including educational practitioners.

No-year funding will allow many programs to be initiated and developed according to schedules that are not tied to the deadlines of the fiscal cycle.

Intermural R. & D. would also be an important part of the NIE's ability to effect change and to relate to the work of educational R. & D. throughout the country. These features are not readily available in the National Center for Educational Research and Development, which occupies half of my time at this moment.

Let me take a few minutes to describe the National Center for Educational Research and Development for you.

The center, referred to as NCERD, has four major activities: educational research, development, institutional support, and researcher training.

RESEARCH

Our research activity is concerned with unsolicited proposals that are initiated from outside the Office of Education. Because the prime objective of this activity is to promote the development of new knowl-

edge, the researchers we fund should be drawn from all the disciplines relevant to education. We are attempting to increase the range of disciplines from which our grantees are obtained and to identify the best talent in the country to work on educational problems.

NCERD's unsolicited research is divided into three programs: basic research, applied research, and regional research. The basic research program supports research in academic disciplines related to education. This program contributes to our knowledge about how people learn and helps us to better understand the social factors that affect the ability of children to benefit from educational programs.

The second program is applied research, a program that encourages development of projects for more immediate impact upon pressing educational problems. For example, the University of Pittsburgh has a project to plan ways for an urban university to change the emphasis of its program from highly academic to activities that solve community problems.

Educational Testing Service had two projects to identify the extent of the reading problem in the country and to describe the reading skills and adult needs to cope with everyday problems of work and living. As a last example, we have just begun a new project to develop a televised program that trains disadvantaged mothers to teach their children. Dr. Lanny Morreau from Minnesota heads that project.

Finally, the research activity includes a $2 million small projects program that awards grants up to $10,000. These grants are administered in the 10 regional offices and serve to help identify and support the work of outstanding young people from both small and large colleges and universities all over the country.

DEVELOPMENT

Our development activity is aimed at solving a few major problems in education. We have decided to focus first on the problem of unemployability of young people who are leaving school without saleable skills and without the inclination to continue their education. We are planning a program of development to help alleviate this problem. Our planning has resulted in an effort to establish three models for career education: a school-based model, an employer-based model, and a home-based model. The models will be developed and modified until they prove to be successful as measured by the career outcomes of students and by the exportability of these models to other locations.

The school-based model, aimed at improving school practice, would organize the entire curriculum around career development, beginning in the elementary school. We plan to develop one to three major demonstrations of this model in fiscal year 1972, building from the best current programs available.

The employer-based model will be created, developed, operated, and supported primarily by business organizations. A group of industrial, commercial, and other kinds of firms would collaborate in developing the program for the benefit of the 13- to 20-year-old age group. The emphasis in this model will be on providing work experience to familiarize young people with the corporate world of work.

The home-based model will provide experience and opportunities for individuals to become more employable by using the home as a center for learning. One of its primary purposes will be to increase the accessibility of career education to individuals who are confined to the home, such as women with young children. The major component of the model will be a career-oriented TV program. The program will consist of spot commercials and special programs to be broadcast on commercial and ETV networks. The primary objective will be to change attitudes toward work.

INSTITUTIONAL SUPPORT AND RESEARCH TRAINING

The third and fourth activities of institutional support and researcher training are combined into one program area because of their logical relationship. The primary functions of these activities are to develop R. & D. capability in the country and to undertake R. & D. programs.

Our $33 million institutional support program has eight R. & D. centers and 11 laboratories which operate some 60 different R. & D. programs. Among their major areas of emphasis are development of instructional programs (such as the SWRL reading program and the Wisconsin multiunit schools approach); problems of urban education (such as the midcontinent lab's inner city teacher education program to place prospective teachers in ghetto schools during their senior year); evaluation, which is the major area treated by the UCLA R. & D. center, and early childhood education, represented by centers in the national program for early childhood education.

The researcher training program has been changed from fellowship support of researcher trainees seeking the doctorate to internship training of people in development skills.

We have established three consortia of development agencies, like publishers, film producers, laboratories and universities, to provide internships for potential developers.

The remainder of our program is used for internship institutes for developers, materials development, training of minorities in R. & D., manpower analysis and planning studies for researcher training.

Nearly all of NCERD's budget and functions will be transferred to the NIE. This represents $88.5 million at the 1972 requested level. The major demonstrations program, at $2.25 million in fiscal year 1972, would be one exception—this is consistent with the decision to have demonstration programs in the Office of Education. The other exception is the National Achievement Study, which will remain in the Office of Education as part of its information-gathering role.

As Dr. Davies stated, we cannot say at this time precisely what will happen to each program and project as NIE assumes responsibility for these funds. Commitments must be honored whenever possible, without blocking the new agency's drive for progress.

Dr. DAVIES. I would like to call on Dr. Robert Binswanger, Director, Experimental Schools Program, to read his statement, Mr. Chairman.

STATEMENT OF ROBERT B. BINSWANGER, DIRECTOR, EXPERIMENTAL SCHOOLS PROGRAM, OFFICE OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Dr. BINSWANGER. Mr. Chairman, the experimental schools program is a new initiative of the Office of Education that serves as a bridge from research, experimentation, and demonstration to actual school practice by supporting a limited number of large-scale projects of comprehensive design that have a major focus on documentation and evaluation.

The failure of so many schools to educate and of so many children in school to learn, is, perhaps, the most persistent and critical challenge of our times. Efforts to correct this negative condition and attempts to bridge the gap between developmental educational research and actual school practices have been fragmented and piecemeal and have had a very limited effect upon solving educational problems.

A number of educators, both inside and outside the established school system, are seeking opportunities to experiment on a large scale with comprehensive educational alternatives. The experimental schools program supports such initiative. In January 1971, letters of interest were solicited from the field and from 514 applications received eight planning grants were awarded in February to those applicants who demonstrated both the ability and the commitment to combine a series of promising practices into a comprehensive program of education reform ready for operation by September 1971.

The eight applicants (Austin, Tex., Berkeley, Calif., Ferguson-Florissant, Mo., Pierce County, Wash., McComb, Miss., Minneapolis, Minn., Portland, Oreg, and Rochester, N.Y.) submitted proposals in April and these were reviewed by an independent selection committee. Three were asked to submit final plans based on the strengths of the proposals and Berkeley, Franklin Pierce, and Minneapolis were designated as experimental school sites.

A second competition was announced at the end of March and letters of interest were again solicited from a broad spectrum of agencies, organizations and institutions. The new competition differs from the first in its stress of alternatives to what exists today. It invites creative, innovative, comprehensive designs to reform, reshape, and redefine current school organizations, practices, and performance. The experimental schools program is conceived as a bridge (or set of bridges) between research and development and actual teaching practice.

It emphasizes the utilization of research findings and new educational programs and practices in the development of workable alternatives. And it welcomes new organizations and organizational structures committed to testing new approaches to education; hence the experimental schools program is not limited to school districts.

An experimental school project must be comprehensive in that it includes at least the following:

(*a*) Project goals in terms of the kind and purpose of the learning experiences to be provided.

(*b*) A plan for broad participation in the design, implementation, and operation of the project including a viable relationship with the community.

(*c*) A coherent, integrated, mutually reinforcing set of "operational variables" including, but not limited to—

(1) The nature and substance of the curriculum;

(2) The nature, role, and organization of staff, and necessary staff training;

(3) The use of time and space, including possible variations in the length of the school day, school year, or number of years required of participants in the project;

(4) An administrative and organizational structure consistent with and supportive of the program.

(*d*) The term "comprehensive" has acquired a specific connotation among educators referring to the breadth of the curriculum; for example, the comprehensive high school. The term is used here in its broader and less technical sense meaning "accounting for or comprehending all or virtually all pertinent considerations"; for example, including at a minimum all the significant elements of a formal educational program.

As you know, the experimental schools program will be transferred to the National Institute of Education. We are now making long-range commitments to the schools we have chosen for support. Over the next five years, we expect the program to fund five educational organizations annually, encouraging them to design and construct a comprehensive educational program which presents a significant alternative to present school programs, structures, and practices and performance.

By 1976 we expect to see 20 to 30 projects in operation. A deliberate attempt at diversity will be made so that these projects will represent a full range of alternatives in terms of program content, approach, organizational structure, and potential solutions to many of the Nation's educational problems, both urban and rural.

The experimental schools program should not duplicate programs presently available. The experimental schools program is not a "model" school program in the sense of a building model that represents Federal preference. The experimental schools program is concerned with demonstrating new and better ways to educate citizens, applying ideas already verified as feasible by prior research and practice, as well as ideas yet to be evaluated.

Support for each project will be limited to incremental costs associated with the implementation of the program such as the development of staff necessary for the operation of the program, the development of materials, minor remodeling, and evaluation and documentation of the project. The experimental schools program cannot support the basic per pupil expenditure which provides for the operational costs of the project, and it cannot support major construction. Each applicant organization must indicate its commitment to provide operating costs for the full 5 years of operation of the experimental school project.

The eventual cost of operating an experimental school project after the anticipated development work is completed must be kept within the limits of available resources so that the program could be continued after the anticipated 5 years of Federal support.

Dr. DAVIES. The next statement, Mr. Chairman, will be made by Dr. Lee Burchinal, Director of the National Center for Educational Communication.

STATEMENT OF LEE G. BURCHINAL, ASSISTANT COMMISSIONER, NATIONAL CENTER FOR EDUCATIONAL COMMUNICATION, OFFICE OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Dr. BURCHINAL. Mr. Chairman, the National Institute of Education will attain its promise only if its results are actually in widespread use to help improve education. We are pleased to have an opportunity this morning to discuss some ways in which the Office of Education will be able to help the National Institute for Education to attain its goal.

One of the programs in the Office of Education that should assist in this regard is that operated by the National Center for Educational Communication.

The National Center for Educational Communication administers an $8.5 million budget. In managing this dissemination program, we are pursuing five basic objectives:

1. accelerating the spread and installation of validated practices and research based products;
2. strengthening the capabilities of educational organizations to communicate and apply validated practices;
3. increasing access to the current knowledge base or in education;
4. interpreting and disseminating summaries of current knowledge for use by educators; and
5. improving the application of knowledge through applied R. & D.

To work toward these goals NCEC is carrying out a number of different kinds of activities. We are supporting generalized communication programs, serving all educational audiences. ERIC and the targeted communications program are two examples. We support projects for disseminating information about and installing specific exemplary program outcomes. Three model States dissemination systems are being developed. The Center provides technical assistance in dissemination and using capabilities among education organizations. Finally, we are providing information services to OE professional staff, through the Educational Materials Center and the Educational Reference Center.

NIE will assume responsibility for research and development of new delivery systems. NCEC has budgeted $550,000 for this function in fiscal year 1972, and these funds will be transferred to NIE the next year. NCEC would continue to allocate a small amount of resources for operations and policy-oriented research for quality control of its dissemination and installation programs. We expect a substantial increase in NIE's funds for research in dissemination to support a major development effort in dissemination.

There must be an aggressive program to disseminate information and foster adoption of the outcome of research and development. It will be the responsibility of the Office of Education to manage that program, while NIE is exploring new approaches.

There are several reasons for this:

The undesirability of burdening NIE with operating responsibilities in any area, including dissemination. These could distort its R. & D. function;

The need to avoid duplication of activities;

The chance to build on NCEC's existing capabilities; and

The need to make use of OE's support programs in installing research and development results.

Both the Office of Education and the National Institute will benefit from mutually supportive relationships between the two organizations. Among the benefits to the Office of Education will be:

1. Production by NIE of an increased number of validated alternative practices to current practices.

2. Generation of research findings and prototype development of improved dissemination and installation strategies by NIE for implementation by OE.

3. Development of prototype designs for training of personnel for dissemination and installation roles in education.

Benefits accruing to NIE from support to be provided by OE include:

1. Assistance during product development to assure that NIE products are not only effective, but cost competitive with existing materials and feasible for use in operating educational settings.

2. Use of ERIC for:

Providing NIE planners and managers quick access to current knowledge relevant to education, including both research reports and examples of exemplary school-developed programs.

Storage, retrieval, and worldwide dissemination of all documents emerging from the total NIE program.

3. Delivery of NIE products through:

Use of existing publication and distribution systems, as facilitated by the OE copyright program and the Publishers Alert Service.

Use of delivery systems that draw upon the contributions to product utilization by State educational agencies, local educational agencies, and institutions of higher education.

The impetus of major support programs administered by OE, including the Education Profession Development Act, the Elementary and Secondary Education Act, the Vocational Education Act, and the like.

Dr. Davies. I would like to call next on Dr. Edward W. Martin, associate Commissioner, Bureau for Education of the Handicapped. He is accompanied by Dr. James Moss from his staff.

STATEMENT OF EDWIN W. MARTIN, ASSOCIATE COMMISSIONER, ACCOMPANIED BY JAMES MOSS, BUREAU FOR EDUCATION OF THE HANDICAPPED, OFFICE OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Dr. Martin. Mr. Chairman, I would like to submit the statement for the record and then just abstract it by reading certain sections of it and perhaps shorten it up that way.

(The statement referred to follows:)

PREPARED STATEMENT OF EDWIN W. MARTIN, ASSOCIATE COMMISSIONER, BUREAU FOR EDUCATION OF THE HANDICAPPED

Mr. Chairman, members of the Subcommittee, thank you for the opportunity to discuss with you our plans for research and demonstration activities in the area of education of handicapped children in relationship to the NIE. Essentially, we propose to continue the development of our activities in this area, sharing the responsibility between the National Institute for Education (NIE) and the research and demonstration program of the Bureau of Education for the Handicapped (BEH).

This year for the first time we are moving into a new phase of Office of Education concern for the education of the handicapped. United States Commissioner of Education, Sidney Marland, has made education of the handicapped one of the Office's five main priorities, and on April 21 the Commissioner called for the development of a national goal, involving State and local, as well as Federal efforts, to provide full educational opportunity for handicapped children by 1980. Research, development, demonstration, and dissemination activities in the National Institute of Education and in the Bureau should be developed as part of a comprehensive attempt on the part of the Office of Education to achieve full educational opportunity for handicapped children.

Concern for education research for the handicapped children can be traced to the first Office of Education research activities under the Cooperative Research Act. From this beginning, appropriations have grown from $1 million under Cooperative Research in 1957 to about $15 million under the Education for the Handicapped Act.

Since Congress mandated the creation of the Bureau of Education for the Handicapped in 1966, research, training, media and grants to the States for education of the handicapped were brought together into one operational unit.

The relationship of the research program to the personnel training and services programs of the Bureau of Education for the Handicapped has provided many examples of successful interaction. The current emphasis on preschool programming is directly related to promising research funding in this area. Personnel training programs for the blind have been altered significantly on BEH-supported research showing that blind children can use and should use residual vision for educational purposes. The Instructional Materials Center system, over 300 units across the Nation, now operated as a service program to teachers, began as a research program and in general—a research, training and services partnership has been created to work on specifically identified targets such as the above.

CURRENT RESEARCH ACTIVITIES

The program of research in education of the handicapped has emphasized applied research. The guidelines issued by the Bureau indicate that an applicant must specify the educational problem which he is attempting to solve and indicate how his proposed research will either solve the problem or lead to its solution. Applicants are generally asked to indicate how programs for handicapped children would be different if his research hypotheses were confirmed. A division of labor emerged between the old Bureau of Research, now called the National Center for Educational Research and Development and BEH, with NCERD supporting more basic research and all other applied educational research, and with BEH supporting only that research which was clearly relevant to problems of handicapped children.

Current research and related activities in the Bureau of Education for the Handicapped fall into several broad categories, as follows:

	Percent
Project research	17
R. & D. centers	15
Curriculum development	16
Demonstration and dissemination	20
IMC–ERIC dissemination program	32
	100

Approximately $5 million is currently invested in research projects and R&D centers, making up about one-third of the Division's budget of $15 million. Almost half of the Division's current funds (and approximately half of its funds over the life of the program) go into demonstration or dissemination activities.

Examples of such activities include: (1) a demonstration of how deaf youngsters can be given postsecondary technical training in institutions normally reserved for hearing students, replicated in three settings; (2) a demonstration of a program for educating cerebral palsied children found to be successful in a foreign country; (3) field testing of the OPTICAN, an optical to tactile converter for the blind; (4) a demonstration of a preschool program for deaf-blind children; (5) a demonstration of the use of theater to influence attitudes toward the deaf; and (6) the dissemination of an instructional program found effective for treating children with voice disorders.

The Bureau presently supports a number of curriculum development activities. One project is developing an arithmetic curriculum, another adopting the general biological curriculum for handicapped children, and a third developing a social learning curriculum for retarded children. The Bureau is also investing in the development of a computer-aided-instruction program for use with the deaf, the first application of CAI to a handicapped population.

RELATIONS WITH NIE

Approximately $5 million is currently invested in activities which we feel are most appropriate for support under NIE. This would include support for the R&D centers and the project research. It can be anticipated that the ongoing project research will not require support from NIE by FY 73, as the projects will either be terminated or fully funded. If the R&D centers are continued in NIE at their present levels, approximately $2.5 million will be available for new activities. We will continue to manage the research projects and centers until NIE is appropriately staffed to assume professional responsibility for monitoring them.

It is important to specify those functions which will be the responsibility of NIE and those which will be responsibility of BEH. It is proposed that the distinction be made based on projected end-products of the activities rather than arbitrary descriptions of the activities themselves. This is because similar activities may produce different end products. For example, evaluation studies and research studies may employ precisely the same procedures but in one case the end product is a new addition to the knowledge base while in the other it may be an adjustment in an operating program.

It is proposed that NIE assume responsibility for expanding the educational knowledge base, while BEH assumes responsibility for immediate impact on the education of handicapped children. This, in general, would lead to NIE supporting research of a long-term nature on variables such as the development of intelligence, the development of communication, language, and cognitive skills, the effective integration of handicapped children into regular education programming, the study of personality characteristics and their interaction with educability, etc.

BEH on the other hand, would invest in activities which were of immediate need for program development, improvement, management, and evaluation. This would include short-term applied studies such as the effects of various educational models now supported by BEH programs on the learning of handicapped children, the efficacy of differing administrative structures for organizing preschool programs, the utilization of specially designed resources in the classroom, and the need for and effect of paraprofessionals in classes for the handicapped. Research supported by BEH would therefore be characterized by the need for an immediate answer to a problem which effects the operation of the Bureau or related OE programs.

In addition to its research and development efforts as they relate to immediate programmatic decisions, the Bureau would continue its demonstration and dissemination activities. This would include a range of activities such as our efforts concerning visual aids for the blind I mentioned before. In this particular instance, the Optical to Tactile convertor was developed because of the obvious problem that blind children have in obtaining information from the printed page as an attempt to supplement and improve on the information that can be gained from braille materials. Development of the device is to be followed by extensive field testing and evaluation which in turn will be followed by a large-scale demonstration of its use. We can then use our resources to encourage manufacturing of the device and see to it that funds become available either through the private sources and/or from the Bureau in combination with other State or Federal agencies, for dissemination to blind users.

Thus, the Bureau would continue to support limited kinds of research activities, curriculum designed for specific categories of handicapped children, evaluation studies, dissemination activities, personnel training models, educational communication systems, etc. All of these activities will be oriented toward the specific purpose of improving the education of handicapped children in the immediate future. They will be closely tied to overall Office of Education and BEH objectives. They will, in fact, be the tools used by the Bureau in its catalytic strategies for achieving the national goal of full educational opportunity for handicapped children by 1980.

NIE COMMITMENT

The U.S. Office of Education has committed itself to improving the education of handicapped children and NIE research will be based on the recognition of the needs of these children and their right to effective education. The Bureau of Education for the Handicapped's active educational improvement program will complement NIE's investment of funds in longitudinal and basic studies which are necessary for bringing about improvements in the future. While NIE may begin with those activities and funds which have previously been the responsibility of BEH, it will move ahead to expand these programs and to initiate new efforts.

The relations between NIE and BEH must reflect the same priorities and be based on rapid sharing of information. New research ideas often have implications for new development, demonstration, or programs. Information about research proposals submitted to either NIE or BEH will automatically be shared by automated information systems. New program thrusts should be developed jointly between NIE and BEH. New developments generated by BEH as well as data obtained from evaluative studies will be made known to NIE.

We have demonstrated that joint activities in the training of education manpower for handicapped children can be conducted between two related programs. For three years BEH and BEPD have jointly planned in this area, with BEPD training regular educators to be more able to serve handicapped children, and BEH training specialists. A number of jointly planned activities are underway.

SUMMARY

The responsibilities of BEH and NIE differ significantly and these differences determine the functions of each. While perhaps a slight oversimplification, basically, NIE has the responsibility for developing a viable research program which will seek to renew education in the decade to come while BEH has the responsibility of making the education system appropriate for the handicapped children who are in school today. NIE, in the development of its programs and in the allocation of its resources, must insure that tomorrow's handicapped children are not penalized by the school system. BEH must move quickly to impact on today's State and local programs. BEH must know now how to rapidly modify its State support programs, teacher education programs, and educational technology programs, and to provide approriate develomental assistance to the States.

In summary, NIE will offer to handicaped children new and wider research resources. The goal of educating handicapped children will become more deeply a part of the goal of improved education for all children. Simultaneously, the coordinated programmatic thrust of BEH and other OE programs, Vocational Education, Title III, etc., will have available support from BEH research and demonstration programs.

Dr. Martin. Thank you for the opportunity to discuss our plans in education of handicapped children.

Essentially we propose to continue the development of our activities in this area sharing the responsibility between NIE and the research and demonstration programs of the Bureau of Education for Handicapped.

This year for the first time we are moving into a new phase of Office of Education concern for education of the handicapped. U.S. Commissioner of Education Sidney Marland has made education of the handicapped one of the Office's five major priorities and on April 21 this year called for development of a national goal involving State and local, as

well as Federal, efforts to provide full educational opportunities for handicapped children by the year 1980.

The research, development, demonstration, and dissemination activities of NIE and in the bureau should then be developed as part of a comprehensive attempt on the part of Office of Education to achieve full educational opportunity for handicapped children.

The relationship of the research program to the other programs that are operated by OE, such as personnel training and service, has provided many examples of successful interaction.

The current emphasis on preschool education for handicapped children is directly related to promising research results from this area. Personnel training programs for the blind have been altered significantly because BEH research has found that blind children should and can use residual vision for educational purposes.

The research center material which now consists of 300 units across the Nation was operated first as research program and now has been converted to our service authorities for basic support.

Essentially then we have attempted to develop a research and training and service partnership to work on specifically identified targets. The current research and related activities in the Bureau of Education for the Handicapped fall into several broad categories representing percentages of total funding project research of about 17 percent, R. & D. Center 15 percent, curriculum development 16 percent, demonstration 20 percent, and IMC ERIC dissemination program 32 percent.

In all, $5 million is invested in research projects in R. & D. centers, about a third of the division budget.

The rest of the activities go into demonstration and dissemination, including such programs as demonstration of how deaf youngsters can be given postsecondary technical training in institutions normally required for hearing students, demonstration of programs for educating cerebral-palsied children, field testing of Optican, which is an optical converter for the blind, and a number of sharply defined and applied kinds of demonstrations.

Approximately $5 million is currently invested in activities which we feel are most appropriate for support under NIE. This would include support for the R. & D. center and support for project research.

It can be anticipated that will not require support from NIE by 1973, as all of the projects will either be terminated or fully funded. R. & D. centers, however, should be continued by NIE at their present level, and so approximately $2½ million of the $5 million slated for transfer will be available for new activities.

We would like to specify the functions which will be the responsibility of NIE and those that will be the responsibility of BEH.

It is proposed that the distinction be made on projected end products rather than on description of the activities themselves because similar activities may produce different end products.

For example, evaluation studies and research studies may employ precisely the same procedures, but in one case the end product is new addition to the knowledge base; in the other it may be adjustment on how program is operated.

NIE must assume responsibility for expanding educational knowledge base. BEH will assume responsibility for immediate impact on education of handicapped children. This would lead to NIE support-

ing research on long-term nature on development of intelligence, communication language, and cognizant skills, effective integration of handicapped children into regular educational programing, study of personality, and so forth.

BEH, on the other hand, would invest in activities which would have immediate need for program development or improvement or management or evaluation. These would be short-term applied studies such as effects of various educational models which are now supported by BEH service or training programs on learning of handicapped children.

The utilization of specially designed resources in the classroom. Need for effective paraprofessionals in classes for handicapped, and so forth.

Essentially, BEH research would be characterized by need for immediate answer to a problem which affects operation of the Bureau or related Office of Education programs.

The Office of Education has committed itself to improving the education of handicapped children and NIE research will be placed on recognition of the need of these children and right to effective education.

BEH active educational improvement program will complement NIE investment of funds which are necessary for bringing these improvements about. While NIE may begin with those activities and funds which have previously been responsibility of BEH, it will move ahead to expand these programs and to initiate new efforts.

In summary then, the responsibilities of the Bureau and NIE differ significantly, and these differences determine the function of each.

While perhaps a slight oversimplification, basically NIE has the responsibility for developing a viable research program which will seek to renew education in the decade to come, while BEH has responsibility of making education system more appropriate for handicapped children today.

NIE in the development of its programs and in allocation of its resources must insure that tomorrow handicapped children are not penalized by the school systems. BEH must move quickly to impact on today's local and State programs.

In summary, NIE will offer to handicapped children a newer and wider research resources, will become more deeply a part of the improved education for all children, and simultaneously the coordinated program of BEH's added thrust, will have available support from BEH research and demonstration activities.

Thank you.

Dr. DAVIS. The three members of the NIE Planning Unit who work under Dr. Silberman's direction are here, Mr. Chairman, and they are also prepared to answer your questions. They are at the table. Dr. Robert Davis, Dr. Joe Lipson, and Dr. Beverly Kooi. We are expecting to be joined in a few minutes by Mr. Burt Lamkin, Associate Commissioner of the Bureau of Library and Educational Technology, who would be prepared to talk about the research program in his bureau.

That concludes our opening statements.

Mr. BRADEMAS. Thank you very much, Dr. Davies and gentlemen.

Let me, for purposes of being as orderly as possible, put questions to each of you as I go along, perhaps seriatim, but if you would like

to comment on one of my questions, or if someone else would like to comment on one of my questions other than the person to whom I put it, I hope he will feel free to speak up.

Dr. Davies, I wonder if you could make some comment on the significance of the document you have submitted to the committee dated May 12, 1971, and headed, "OE Research and Development Programs."

It is not altogether clear to me from that listing just what is the significance of the figures.

I might focus your thinking a little more specifically if I observe that, as I recall, Commissioner Marland when he testified before the subcommittee, said that in the first fiscal year of the life of the proposed NIE, he anticipated a budget in the order of $150 to $200 million, and that of that amount, $120 to $140 million would be in the form of authorities transferred from the kinds of programs you gentlemen are presently administering.

Yet the fiscal 1972 request under your item one, "Programs Likely To Be Transferred to NIE," total $112 million, and I am therefore somewhat confused about the arithmetic.

Dr. Davies. The list is a revision of the list that the Commissioner presented to you when he testified. The revisions reflect two things. First, the action of the House Appropriations Committee on the administration's budget request for 1972 affected about $3.5 million of research and development funds the $3.5 million was earmarked for specific programs but no additional money was added to the total R. & D. budget leaving a deficit of $3.5 million; second, it reflects further analyses of each of the programs here by the planning unit to determine which, in fact, are the research and development activities. This document is a refinement of the first, based on results of the House appropriations action. It is our best estimate at the moment. It may be subject to further adjustment after the action of the Senate Appropriations Committee.

Mr. Brademas. As of your present thinking, how much new money, that is moneys beyond those presently administered in OE on R. & D., do you contemplate requesting for the NIE?

Dr. Davies. The figures which the Commissioner gave to you, $150 to $200 million figure, are still the figures that we are using as the basis for our planning. That has to be subject to the action of the Department and the Office of Management and Budget on total overall ceiling available to the Department for its 1973 budget planning. That process is just now beginning, but the planning figures that the planning unit is using, are $150 to $200 million.

Mr. Brademas. If you are using $150 to $200 million, and your fiscal 1972 request as of what you have given us, is $112 million, then I still don't have an answer to my question.

Dr. Davies. Using $150 million as the minimum, there would have to be a minimum of $38 million of new money in addition to the $112 million before you here.

Mr. Brademas. Thank you.

I was interested to see, Dr. Davies, your statement first, that the planning unit that you now have working on the NIE has developed a work plan which establishes a timeframe for the work of the NIE; second, that the plan has recently been approved; and, third, that you hope to keep our committee informed of your progress as we go along.

I am very glad to hear that, and I wonder if you would let us see a copy of the plan.

Dr. DAVIES. I would be delighted to submit for the record the revised plan which is here.

Mr. BRADEMAS. That would be helpful. We might take a look at it, and then perhaps informally meet with you sometime after members of our subcommittee have had a chance to look at it and give you any reactions or judgments we have. I make this request because my own view, as I think you are aware, is that consideration of the National Institute of Education is of such importance that it ought to be the product of an effort both cooperative, as between the executive and legislative branches, and bipartisan if it is to be an effective enterprise.

Dr. DAVIES. We would be delighted with that, Mr. Chairman.

(The document referred to follows:)

PROPOSED WORK PLAN FOR THE PLANNING UNIT FOR PERIODS ENDING JUNE 30, 1971, AND JUNE 30, 1972

I. This document presents a work plan for the Commissioner's Planning Unit for the period ending June 30, 1971 and June 30, 1972.

II. *Output Desired by June 30, 1972.*

The main task of the Planning Unit is to deliver to the Commissioner of Education and to the Director of the NIE (to be named if Congress passes pending legislation) documents concerned with the following:

1. An identification and analysis of problem areas of education. Criteria for selecting problem areas will be established and applied to candidate problems obtained from a variety of sources. Sources will include documents and personal contacts. The resulting problem areas will be listed and will be described by presentation of appropriate statistical data. Some of the problem areas will be analyzed in depth and will include responses to the following questions:

a. Where are significant programs addressing this problem?

b. What assumptions and methods are being used in analyzing the problem?

c. How well do these "solutions" work? How adequately has each program been described? What research questions does it raise?

d. What development remains to be done?

e. What different viewpoints exist as to the most promising R&D approaches?

f. Can or should these different viewpoints be reconciled? (In some cases an unreconcilable difference of opinion may lead to a researchable question of some importance.)

g. What limitations (statutory, habitual, economic personnel competencies, political, etc.) are included in the problem?

h. Will such limitations yield to practical solution? (Estimated costs in dollars and manpower will determine which solutions are amenable to a new R&D institution with limited resources. The program plan can ignore questions of cost, feasibility and probability of success only at the risk of becoming a pedantic exercise.)

Most important, for each problem area, alternative R&D programs will be described with detailed costing and time projections accompanied by a discussion of advantages and disadvantages of proceeding with each program.

2. A document describing a recommended internal structure for NIE. The document would include:

a. Alternative personnel policies (including discussion of recruitment, selection, training, remuneration, and termination policies).

b. Alternative program management policies (including stimulation, selection, contracting, monitoring, and evaluation of external programs, in addition to policies governing the intramural R&D program).

c. Alternative policies for external relations (including planning, relations with other agencies and organizations, legislative activities, and constituency building.

III. *Outputs Planned for the Period Ending June 30, 1971.*

1. A draft list of major problems, with a short rationale of each.

2. Three problem areas layed out in moderate detail with a preliminary delineation of sub-problems, existing or possible lines of attack, at least one preliminary review of relevant research, with accompanying data. A projected list of background studies needed to better understand each problem will be defined.

3. An initial estimate of the probable NIE budget for fiscal year 1973 will be made, including the following:

a. A tentative budget based upon a substantive analysis of programs.

b. Which programs will be transferred and what will be the nature of the transfer.

c. Which funds are unrestricted and available for new R&D commitments.

d. Which funds have "moral" commitments, and what these commitments are.

4. A document describing methods for involving a broad range of outside consultants, in order to:

a. Extend the planning work already started by the Planning Unit.

b. Begin to provide for subsequent recruitment of personnel.

c. Achieve widespread involvement of the many relevant public, academic, and professional groups and individuals.

IV. *Output Planned for Delivery by September 1, 1971.*

1. A document tentatively detailing systematic cost estimates for various forms of R&D activities, analyzed on a modular basis allows for contingencies.

The document will include the number and type of personnel needed for various classes of NIE activity with implications for the number of non-civil service and civil service people required.

V. *Outputs Planned for the Period Ending December 15, 1971.*

1. Revised list of major problems with a position paper on each, written through collaboration of consultants and planning staff members.

2. One problem layed out with background review completed. One or two solution-oriented projects specified and an appropriate number of others tentatively suggested to follow.

3. Alternative plans or organizational structure that would be appropriate for NIE including procedures for management of R&D efforts.

4. A document specifying in detail a recommended process for handling the transition from existing OE commitments to whatever new priorities and commitments NIE will recognize. This plan would be developed in cooperation with the Office of the Deputy Commissioner for Management, and would focus particularly on the Regional Education Laboratories and on the R&D Centers.

Mr. BRADEMAS. Let me observe that on page 2 of your statement, Dr. Davies you refer to the NIE, and you said, "where its main thrust is to assist schools today using tools we already possess."

You use the phrase "schools," and then I recall the phrase of Dr. Silberman in his testimony when he suggests that the NIE is to encompass all phases of education. I know the word "schools" in the American context is an ambiguous one, and that when you ask in this country where does someone go to school, you could mean high school or university; whereas in Great Britain, you mean elementary or secondary school.

I just want to be sure that we are all in accord in our understanding that the NIE covers all phases of education from the earliest years throughout life, as it were, both in formal institutions of learning and outside.

Is there any quarrel with that proposition?

Dr. DAVIES. There is no question about that. I was using the word "school" in the American sense.

Mr. BRADEMAS. I note also, I must say in all candor, and I don't say it critically because I know how letters are often drafted, that in the letter of the President which I quoted earlier, he speaks of "improving the education of children" when he talks about the purview of the activities of the NIE. So, I do think it is important that we all understand when we talk about the NIE that it is not to direct or confine

or restrict its scope of activities to any particular level of education. And I am, therefore, reassured by what you have said.

Dr. DAVIES. I quite agree with that, Mr. Chairman.

Mr. BRADEMAS. Another question that concerns me, if we could talk about budget for a moment, is that you are proposing, as I understand it, $3 million for planning for——

Dr. DAVIES. For fiscal 1972.

Mr. BRADEMAS (continuing). For fiscal 1972.

I want to come back to that picture subsequently, and I mention it now so as to not forget it, but let me ask if you could give us any comment on a philosophical question, as it were, with respect to the NIE. I am very pleased that our distinguished ranking minority member of the full committee, Mr. Quie, is here today because he and I are both enthusiastic, I think I am not inaccurate in representing him, proponents of this proposition.

Let me speak of one of the concerns that many of us in Congress have had about educational research, and I am now talking about a subject that I think will touch on Mr. Burchinal's activities and Dr. Silberman's responsibilities. We are concerned about the effectiveness of dissemination into the system of the results of research. I am sure you are all familiar with the observation on the part of many Members of Congress that the results of research don't get into the system. My own feeling is that one reason that a lot of Members of Congress are not very enthusiastic about educational research, aside from the fact that most of us don't know what it is, is that whatever we think it is, it doesn't make much difference; and one of the reasons we don't think it makes much difference is our apprehension that it does not get into the system.

Maybe one of the problems is that we have in mind this rather linear model of educational research, where you have a researcher on this end of the line and then you do some development and demonstration, and the research gets into the system in a kind of one-way direction. I ask therefore whether there is enough emphasis on the part of educational R. & D. people on two-way communication between themselves and the consumer, the teacher or the learner.

What can you tell us about what you contemplate for the posture of the NIE with respect to this question of generating effective demands on the part of the consumer for what you are doing and building up a really dynamic two-way street?

This question obviously touches directly on your attitude toward dissemination, who administers disseminating activities and how much money you put into dissemination.

Dr. DAVIES. My view, Mr. Chairman, is that the success of NIE and the success of the Office of Education after NIE is established will depend very much on how successful we are in improving our ability to disseminate good ideas and good practices to the field. In my opinion, this is going to depend on a couple of things.

First of all, it creates a close kind of relationship between NIE and OE, very much along the two-way line that you suggest. This would not simply be a linear feeding of a product to OE to be installed to its funded programs, but a constant kind of interchange with ideas and problems deserving solution, and problems about dissemination coming from OE to NIE.

I think our success in both agencies will depend upon our ability to establish more effective interaction relationships with the field—with colleges, universities, schools, and other kinds of educational institutions.

I quite agree that the process of improving education is not a simple linear matter of a researcher, a developer, disseminator, and finally a child in a classroom. It is much more complex than that and, if you were drawing charts, there ought to be arrows going all over the charts showing interaction rather than just a simple line moving along from the researcher to the child.

You can be assured that our planning unit is going to pay very great attention to this whole question of that process of relationship between the work of these two agencies and between research and development and the installation of improved practice. You can also be sure that Commissioner Marland and I, in my new job, are going to be spending a great deal of time determining how OE can best gear itself up for the reform and renewal part of its mission in American education, so that it can be effective in working with the National Institute of Education. That process of reconsidering how the Office of Education, through the Office of Development which I head, can organize itself more effectively has already started.

Mr. BRADEMAS. Let me ask two questions in this respect. If we are in agreement that these relationships must be a two-way street, is it not essential that we give some attention to the question of strengthening the capacity of your consumer population to know what it is you are up to and to have some awareness of alternatives?

To make my point, I might, from another context, use the educational voucher program, where we apparently are going to experiment with the idea that parents will have alternative schools among which to choose where to send their children. I think it is fair to say, if we look at the voucher system, we have to ask the question: How are the parents really going to have knowledge, awareness, appreciation of those several alternatives?

The alternatives are not just going to come into their minds out of the clouds.

In like fashion, how will the school superintendent back in South Bend, Ind., or in smaller communities, or a small community college off in North Dakota, really have any realistic appreciation of what is possible so that he will know how to go about putting questions to the R. & D. community?

Mr. DAVIES. Dr. Burchinal in the National Center for Educational Communication, which has just celebrated its first birthday, has made some progress in finding ways to get at the problem of getting to the school, to the college, to the teacher, to the classroom.

As I indicated before, I see as my major responsibility in my new assignment trying to devise more effective ways of reaching out to teachers, reaching out to the grassroots with help through development assistance. We want to find all kinds of ways of giving them the knowledge and information that they need in order to make the choices that they have to make.

We are a long way from doing that now. We are, however, giving the highest possible priority trying to devise more effective ways, and this will play a central role in our whole program planning for 1973.

Mr. BRADEMAS. In this respect, Dr. Burchinal, you said on page 2 of your statement, if I read you correctly, that you would expect that the NIE would carry out research with respect to improving ways of disseminating the results of research. Is that not correct?

Dr. BURCHINAL. Yes, sir.

Mr. BRADEMAS. But you also said that the responsibility actually to manage the dissemination of information on the results of research would remain within the Office of Education; is that right?

Dr. BURCHINAL. Yes, sir; I think Commissioner Marland in his testimony earlier indicated the Office of Education would do that.

Mr. BRADEMAS. Who does that now? Who is responsible even now for managing the dissemination of the results of research?

Dr. BURCHINAL. May I suggest a starter for continuing this conversation. There is no one way or no one unit that really could take the full responsibility to insure that every product and every system is fully disseminated.

In some cases, as today with regional laboratories, they are able with their own products through their own ties with various clients and groups to see that those products move rather rapidly. I think one example that you have heard about is the individually prescribed instruction.

Others Dr. Silberman mentioned. In other cases we need to base use of the product very closely to the interpersonal ties among people in the same subject field, in which case the appropriate OE bureau should take the lead.

I think Dr. Martin could refer to some ways in which Bureau of Handicapped with their ties to professional associations, to State counterparts, and local counterparts are really in the best position to insure wide knowledge and use of those materials.

In addition, we need other kinds of activities which provide generalized services as with personnel training which is necessary frequently for opening up the readiness for a number of changes and to prepare the staff to use new and different kinds of materials.

Dr. Davies has indicated some ways which under his leadership we will be articulating our dissemination and training activities to provide a variety of ways to help various educational groups to use results from R. & D. and innovative programs.

Mr. BRADEMAS. I think I hear what you are saying, but you know what you have just said could readily be translated as saying we are going to keep things just as they are. And I don't want to misrepresent you, but you really didn't answer my question when I asked a very simple question: Who now is responsible for managing the dissemination of the results of research and development supported by the U.S. Office of Education?

Who does that?

Dr. DAVIES. The specific answer has to be that there is no single centralized manager, but the new organization that the Commissioner has set up with an office of development gives to that office responsibility of making sure that it happens.

Responsibility is taken for this dissemination process in each of the bureaus and each of the programs. I think Ed Martin's bureau has probably been most successful at this, and it might be useful if Ed would respond to this question.

Mr. BRADEMAS. I would like to hear him, but let me press my point.

I hope you see my questions are not meant to be argumentative, but I am trying to elicit some response here because you are telling me that you do not want the NIE to have responsibility for managing the dissemination of the results of R. & D.

That is what you have said in your testimony; right? If I read the English language correctly, that is correct; right?

Dr. DAVIES. That is correct.

Mr. BRADEMAS. Now, you say you want that responsibility retained in the Office of Education. Is that correct?

Dr. DAVIES. That is correct.

Mr. BRADEMAS. Right now one of the principal complaints about educational research and development in this country is that it is not getting disseminated into the system.

I therefore raise the question, if you are not proposing some substantially different method of managing the dissemination of the results of R. & D., you are giving us a prescription for more of the same.

Now, are you telling me, and maybe I don't understand, so I will put the question to you once more, Dr. Davies, are you telling me that in point of fact you are proposing a radically different method of administering dissemination?

Do you see my question?

Dr. DAVIES. Yes, I do. What I was telling you was that my responsibility is to put together a different and more effective management system for getting the best ideas into the field.

Mr. BRADEMAS. I am very dubious.

I hope you can do that and I hope it works.

Dr. DAVIES. If I don't, the Commissioner better get somebody else to try.

Mr. BRADEMAS. I don't think it is so much a question of personalities here as it is a question of structure because quite obviously one of the apprehensions that legislators like us will have when we talk to people like you is whether or not you will be enthusiastic for ceding some of your present authority to a proposed new enterprise. So when I hear sounds like the ones emanating from you now, that is:

> We are not going to allow the proposed NIE, which is going to be generating and supporting R. & D. in education, to have the responsibility for communicating its results out into the system.

I say you may be right, but I would only raise a warning flag there that this could be the path of very serious trouble.

In other words, I don't want to see more walls built up between R. & D. over here and getting it into the system over here, walls of the kind that right now have led to so much frustration on the part of us in Congress who are sympathetic to educational research and development and to the consumers of the results of R. & D.

Dr. DAVIES. You are making your point very clear, and you can be assured our intent is not to build any walls, and it is not a jurisdictional problem.

We in American education haven't learned how to accomplish this task effectively yet, and to accomplish it will require an effective NIE and effective OE and an effective relationship between the two.

One important piece of this, and I want to make sure the record shows it, is that in addition to the planning that we are doing for NIE, the Commissioner has asked me to put together a more effective way of carrying out the Office of Education responsibilities along these lines.

Mr. BRADEMAS. Dr. Martin, did you want to add something?

Dr. MARTIN. Yes, Mr. Chairman.

I think the point you are making and that you made a moment ago on the question of redundancy or feedback into the system is a very important point. I think that Dr. Burchinal's national center being in existence is perhaps the first key to the Office of Education answer, that is a 1-year-old operation which is specifically designed to get at this problem and to put some resources in it.

I think that is what has been missing before, that we haven't had that kind of resource.

In the Bureau, while we have a long way to go, we have been able to develop maybe a third of our research budget in this area of dissemination, and that is a much higher percentage than has been reflected in some other places. We are also at the early stages of having a dissemination system, Jim Moss here began several years ago, to fund a federally supported IMC or Instructional Material Center.

When we first got into it, we thought it would be a one-way street; we would get materials out and make them available to teachers of handicapped children.

We have learned that after they have caught on, 300 are now supported locally by States and local districts, they are still not linked together in systemlike characteristics, but they are beginning to be. What they do is provide us with a tremendous amount of information coming back up through that system about what they want and what they need, so that I am very hopeful that we can do two things.

One is, as we put in an increasing amount of our resources into dissemination, that we will have a system developed which will allow us to carry this out to the teachers; and the second and very important thing is that you get back then from the teachers information about what they need.

One of our projects, for example, is designed to try and pick out materials that might be helpful in teaching a certain concept to a certain kind of handicapped child. What we are doing now on a computer is logging when this material is used and how it is used and what the teacher says about it, and that becomes part of the record, so when the next teacher asks about that material, she gets not only a recommendation as to what the material might be used for, but what others have said, and this is where I think your point is very well taken and that whole question of dissemination has got to be seen as a feedback system in a sense rather than as a one-way street.

Dr. BURCHINAL. Mr. Chairman, may I make one comment, please?

Mr. BRADEMAS. Yes, of course.

Dr. BURCHINAL. Several of our other panelists have referred to the National Center of Educational Communication being quite new. That is true. Still, we can provide several illustrations of the kind of cooperation mentioned by Dr. Davies.

For example, we have been working closely with Dr. Silberman's group and have identified three major products from the R. & D. effort

that are ready for widespread installation. We have used a large proportion of our new funds for this year for installation of these products. One of these is the multiunit school, a strategy for organizing instruction and staffing and individualized instruction, developed by the Wisconsin R. & D. Center. In cooperation with Bureau of Educational Personnel Development about 250 multiunit school programs will be installed around the country.

Here is one example of how two of the units under Dr. Davies' direction already are cooperating with the R. & D. unit to insure that its products are much better known and in a credible setting so that school people can see it operating and can make their choices as to whether or not they choose to use it.

A second type of product is the set of mini courses developed by the Far West Educational Laboratory for pre- and in-service training of teachers. NCEC is supporting development of 8 to 10 model sites around the country where the first five of these mini courses will be used and will be taken on a circuit to the school districts in those several State areas.

By the end of the year, many local districts with in-service programs will have had an opportunity to have at least some of their staff trained under these programs, and then they can decide whether they want to use mini courses as a regular part of their in-service program.

Here are two illustrations where presently validated research materials are being widely demonstrated. These projects were just funded, so the results from this kind of effort will not be available until about mid next year. These efforts illustrate ways we have developed planning and cooperative funding arrangements to insure that the R. & D. based materials are in fact used.

Further, these illustrations point to the types of larger scale and more intensive activities OE will be able to provide to the National Institute by drawing upon an even broader range of authorities such as Dr. Davies has suggested.

Mr. BRADEMAS. I appreciate that observation. I would simply reiterate my own judgment, but this question of dissemination is not one that you gentlemen should look at lightly. That is the payoff. That is going to tell, so far as we in Congress are concerned, whether or not this is all sound and fury or whether we are really serious about it: and I am, for reasons that I will explore in another connection shortly, still up in the air.

I still remain skeptical about how you are approaching it, and I hope that your approach proves effective, but I would want to see more evidence than I have so far seen.

I think the main proof of the pudding so far has been the fix we are in. The fact that we are here right now talking about the need for dissemination is an indication that we have not done an effective job.

Now let me turn, Dr. Silberman, to put a question or two to you, if I may.

You use the phrase, "No year funding." How long do you think we ought to authorize the NIE?

I assume that behind the "no year funding" language was a point of view, which I strongly share, that this is not a short-run enterprise in which we are engaged.

Dr. SILBERMAN. Yes; I think if we are going to establish an organization to provide the leadership for R. & D. in the country, it ought to be with the intention that it is a permanent organization.

Mr. BRADEMAS. You made the point at the outset of your statement describing the process of planning and projecting that is now going on or that you hope to carry out which process will result in the production of a number of documents in some detail spelling out alternatives for research activities. I believe my recollection of that is correct. Is that correct?

Dr. SIBERMAN. Yes.

Mr. BRADEMAS. And the kind of process and planning and projecting that you describe seem to me to be eminently sensible. Why can't you do this right now? That is to say, why have you not been able to engage in such planning up to this point in time?

Dr. SILBERMAN. Are you referring to our doing this as a part of the NCERD activity?

Mr. BRADEMAS. As part of the NCERD activity or part of the Office of Education. The kind of process you were describing in your earlier remarks seemed to me to be so eminently sensible that I was puzzled as to why it has not been undertaken up to this point in time?

Dr. SILBERMAN. I think you are putting your finger on the reasons why we wanted NIE. We have been able to attract three outstanding people into the office to work on a NIE planning unit who might not otherwise have come if it had been to join the ranks of NCERD. We have also attempted in the past months since I have been at the Office, to initiate the program planning activity which I described in my testimony, and that is to develop an analysis of the problem of unemployability and to deduce from that analysis a systematic program which we hope to establish shortly.

Mr. BRADEMAS. I guess what surprises me is that so modest is the amount of money that is being contemplated for planning for the next fiscal year, $3 million, and so essential, indeed indispensable, are the kinds of activities of planning and projecting to which you were addressing yourself, I should have thought that the OE would have found moneys in that modest order of magnitude a long time ago to carry out such activities, but I take it we are not disagreeing.

Dr. SILBERMAN. No.

Mr. BRADEMAS. On page 1 of your statement, you describe the various research programs of NCERD—basic, applied, and regional. You then give us an instance of applied research; namely, the University of Pittsburgh project to plan ways for an urban university to change the emphasis of its program from highly academic to activities that solve community problems.

I read this part of your statement in connection with another statement on page 8 of your testimony when you say that nearly all of NCERD's budget and functions will be transferred to NIE.

Would that kind of a program be transferred to NIE?

Dr. SILBERMAN. Yes; it would.

Mr. BRADEMAS. Then would you tell me how in the world you justify this separate National Foundation for Higher Education, where I should have thought that this project—which you say you would transfer to the NIE—would be precisely the kind of activity that would be undertaken by the Foundation?

Dr. SILBERMAN. Well, as I perceive the National Foundation for Higher Education, it is designed to make some improvements to existing institutions across the country.

The way I have conceptualized NIE, its primary mission is to build basically new alternatives, modifying the structure of institutions, perhaps inventing new institutions for providing educational services in the country. Clearly the NIE will be establishing new alternative models but not attempting to install them in all of the institutions of the country. That would require an extremely large budget.

I see the primary mission of the National Foundation for Higher Education as providing fairly large-scale support for improving large numbers of existing institutions. I would expect that the Foundation would act as a foundation and provide support to institutions that might well emulate developments that have been initially developed and demonstrated by NIE.

Mr. BRADEMAS. That is an exercise in thomistic metaphysics that I have not heard for some time before this subcommittee.

Do you want me to take that response seriously, Dr. Silberman?

I am not trying to embarrass you, but I turn to Dr. Binswanger's testimony in this connection, and I note that he tells me that the experimental schools program will be brought over to the NIE; is that not correct, sir?

Dr. BINSWANGER. Yes, sir.

Mr. BRADEMAS. I note that he says on page 1 of his testimony that the experimental schools program is a bridge from research, experimentation, and demonstration to actual school practice by supporting a limiting number of large-scale projects of comprehensive design.

Now, if you were simply to exchange the word "school" in your opening statement, Dr. Binswanger, for "college and university," I should have thought that this would be an accurate description of the purpose of the National Foundation for Higher Education with respect to university level education; would it not?

Dr. BINSWANGER. My feeling is that experimental schools as a title for a program is probably a misnomer. We are not talking about schools. We are talking about education and higher education is conceived as part of the program we are presently developing.

Mr. BRADEMAS. Do experimental schools involve universities also?

Dr. BINSWAGER. It can involve, I think, education from point zero to one's death. I hope education is continuing.

Mr. BRADEMAS. So experimental schools are not strictly limited to elementary and secondary schools?

Dr. BINSWANGER. Yes; in terms of design in our first year we are focusing on a K-12 criteria for a program to be operational this September.

It was impossible really to deal with any other configuration than the existing kinds of systems, whether they were public or private schools.

Mr. BRADEMAS. Well, I suggest, if you will allow me to say so, if you read your own statement, that it would be very difficult for the lay reader to appreciate that you are dealing in your experimental schools program with other than elementary and secondary schools.

I don't see the word "university" mentioned or "college level" mentioned once, unless I have missed something. You use phrases like "school day," "school year."

Don't we, in normal, common American practice, when we use such phrases, have in mind elementary and secondary schools?

Dr. BINSWANGER. I am talking about the program that we have just funded, and I would say I would be glad to add to the testimony an addendum that would carry the kind of broad scope that not only is envisioned but is part of the process of experimental schools.

Mr. BRADEMAS. Again I am not trying to be difficult, but I think your statement is terribly misleading.

Your paragraph 2 says, "The failure of so many schools to educate and of so many children in school to learn." It seems to me obvious that the way you employ your rhetoric would not lead the man of commonsense to appreciate that you are talking about anything but elementary and secondary schools.

So let me establish that. As I understand it, you are engaged in administering a program which conceivably could provide support for experimental educational institutions at every level; is that correct?

Dr. BINSWANGER. Yes, and not even at every level. It might be communitywide.

Mr. BRADEMAS. Maybe outside of formal institutions of learning; is that correct?

Dr. BINSWANGER. Definitely.

Mr. BRADEMAS. I wish you would get a statement up here as fast as you can that tells members of this committee what the experimental schools program is. I can tell you in all candor, as a member of this committee for some time, that this is the first time I have ever known that it included higher education as well as elementary and secondary.

Dr. BINSWANGER. I will do my best to get a statement immediately.

Mr. BRADEMAS. On the other hand, I am not all that distressed to learn this, because what you have just said in your paper only lends support, in my judgment, to the criticism I have been making all year in this committee of the administration's proposal for a Foundation for Higher Education. As I understand the presently represented mission of the Foundation for Higher Education, it is to stimulate precisely the kind of experimentation and demonstration in colleges and universities that I had, up until this point in time, thought it was the purpose of the experimental schools program to support for elementary and secondary schools.

Why are we having a Foundation for Higher Education for such purposes if that is what is in large measure the purpose of your experimental schools program?

Dr. BINSWANGER. Our program is a very, very small one in its design. It has no more than three to five starts, each of 5 years, and if we are trying to investigate comprehensive ways to improve education, I don't see it in a way duplicating or competing with what the higher education program might be.

Mr. BRADEMAS. I am not talking about the size of the program. I am talking about the integrity of the conceptualization of the program. So the fact you don't have much money to spend doesn't have the faintest thing to do with my question. Do you understand what I mean?

I am asking you what the purpose of your program is. I am not asking you how much money they gave you to run it. You are telling me the purpose of the program is to serve as a bridge from research ex-

perimentation and demonstration to actual educational practice by supporting a limited number of large-scale projects. Is that correct?

Dr. BINSWANGER. Yes, sir.

Mr. BRADEMAS. I am just reading your own statement.

Dr. BINSWANGER. Yes, sir.

Mr. BRADEMAS. What is the difference between that sentence and the purpose, or the alleged purpose, of the Foundation for Higher Education as applied to college and university education?

Dr. BINSWANGER. I assume their specific attention is college and university education.

Mr. BRADEMAS. But you have just finished agreeing with us that college and university education are conceptually contained within the purpose of your experimental schools program.

Dr. BINSWANGER. Yes, sir.

Mr. BRADEMAS. What then is the point of the two different enterprises?

Will you tell me intellectually, conceptually, why two different programs are needed? And don't tell me because you don't have as much money. The administration wants to spend for their National Foundation program $100 million. I have been trying to get an intellectually honest answer out of this administration on this point all year, and I have not got it yet.

What seems to me quite seriously to be the case is that the administration has made a political determination to have a National Foundation for Higher Education, but that they have not yet come up with an intellectually honest justification for it.

Do you have one, Dr. Davies?

If you don't have one, I am not trying to embarrass you; you are not the politicians; you are the civil servants; so I don't have any desire to make your life miserable.

Dr. DAVIES. The Foundation, as the Secretary and Commissioner have talked about it before this committee, would not have the experimentation and research and development kind of role that Bob Binswanger's experimental school would have.

Mr. BRADEMAS. What would it have?

Dr. DAVIES. It would have the capacity to respond to proposals from colleges and universities interested in installing innovative programs in those colleges and universities.

Mr. BRADEMAS. Why couldn't his program do that, conceptually?

Dr. DAVIES. His program is not seen as a responding program nor as a project grant program in the normal sense.

Mr. BRADEMAS. Do you mean he is going to sit there and dream up the ideas and is not going to listen to their requests?

Dr. DAVIES. No. He makes that point very clear in his statement. It is an opportunity on a comprehensive basis in a school system to test out the results of research and development efforts.

Mr. BRADEMAS. What is the difference between what you have just described as Dr. Binswanger's program and the kind of program presented by Dr. Silberman here at the University of Pittsburgh?

Dr. DAVIES. I don't know the University of Pittsburgh program well enough to respond.

Dr. SILBERMAN. I don't think we can avoid the distinction of scale. I think that is really what we are addressing here.

Mr. BRADEMAS. What is the cutoff point?

Dr. SILBERMAN. I think——

Mr. BRADEMAS. Is that a new testament revelation or an old testament prophecy you are going to quote?

You gentlemen are professionals in this field. I just have been appalled by these explanations.

Go ahead. Give me your answer.

Dr. SILBERMAN. If we develop procedures whereby community involvement in the affairs of the university can be established in a model in Pittsburgh and several other locations, the job of supporting similar innovations across the country in thousands of institutions will rest with the Foundation. Its function is to provide grants to help support the widescale distribution of developments that have been established within the R. & D. sector.

Mr. BRADEMAS. This suggests then that the Foundation will be solely a bank where you go to get the money once the decision has been made that the results of some research at the higher education level are worth replicating; and therefore you go to the bank called the National Foundation for Higher Education and say, "Give us some money."

That is what it amounts to. Is that what you mean?

Dr. SILBERMAN. Yes.

Mr. BRADEMAS. Well, that is a distinction that it seems to me enormously difficult intellectually to justify as enough to support a statutory establishment of a brandnew institution at the Federal level in the field of higher education.

We already have a bank. It is called the Bureau of Higher Education an it is located in the U.S. Office of Education.

Why do you have to have a new funding authority, if that is all it is going to do?

Dr. DAVIES. The Bureau of Higher Education does not provide very much discretionary opportunity for that Bureau to support innovation in higher education.

Mr. BRADEMAS. Why can't NIE be engaged in making such judgments?

Dr. DAVIES. I wasn't talking about research and development. I was talking about institutions that wish to innovate. The present higher education legislation provide only very special targeted kinds of opportunities for special services programs; for example—upward bound.

Mr. BRADEMAS. Of course, if you were to adopt the kind of justification that Dr. Burchinal gave us for retaining the management of the dissemination of research results over in OE, on grounds that you are so much better acquainted with your consumers in OE, why could you not use the same rationale for justifying allowing the Bureau of Higher Education, whose officials presumably are on very good speaking terms with university leaders across the country, to make those judgments?

Do you see what I mean. I really do urge, gentlemen, that you all go back and sit down with the Commissioner and think through this Foundation idea, not politically, but think it through intellectually and, conceptionally, rationally, logically. Consider whether you may not be doing an enormous disservice to the whole purpose of the National Institute of Education which I think I have made clear I be-

lieve is a splendid initiative. What you are doing, what the administration is doing by going down this blind alley of the Foundation, is simply making clear to us in Congress that you believe that there is this rigid separation between research and development in education and translating it into the system.

And I repeat what perhaps some of you have heard me say before, that I see no more educational justification for a separate Foundation for Higher Education, for a separate Foundation for Child Development or for a separate Foundation for Career Education or for a separate Foundation for Elementary and Secondary Education, though all of these are areas that any rational person knows cry out for reform and renewal in this country just as much as higher education.

What is so sacred about reforming higher education that it requires a $100 million budget request? Will you tell me?

Dr. DAVIES. The existing programs in the Office of Education for elementary and secondary education address themselves at least in part to the reform and renewal mission. The higher education legislation and authority has been very limited on the reform side. It has been basically institutional support and student aid.

Mr. BRADEMAS. Well, when the tale of title III of ESEA is told, I don't know that we will be able to make that statement with all of that certainty.

Dr. DAVIES. There is nothing comparable in higher education to title III of the Elementary and Secondary Education Act.

Mr. BRADEMAS. No question about it, and it is obviously quite true to say that the system of higher education in this country is radically different from system of elementary and secondary education in all kinds of ways, so that is not a very clear distinction to make.

Let me say, once again, what I have said ad infinitum, indeed ad nauseam. You tell us you want $100 million for next year for the Foundation, for which you have not been able to offer an intelligent justification, while you want only $3 million for next year for the NIE, for which you do have a thoughtful justification—and then you want us to believe that you are serious about improving our system of education.

The President of the United States has come up with a splendid idea on the left hand, and is undermining it with the right hand.

I don't think the Foundation for Higher Education is going anywhere anyway, so maybe I am beating a dead horse.

I am, however, distressed that the Office of Education has been riding the Foundation idea so hard without coming up with a serious educational explanation for it.

Dr. DAVIES. There will be a planning by people working with education, and I am sure they will be glad——

Mr. BRADEMAS. Now, you are the top professionals in the Office of Education. Consider what you are telling us in terms of your logic and rationale. You are going to have a Bureau of Higher Education in OE, as you presently have. Presumably you will have a shop in NIE that touches on higher education activities. Then you want to have a Foundation for Higher Education whose mission is somehow to be distinguished from that of the higher education shop in NIE. That is the troika.

Well, I would argue that you could make the same rationale at the elementary and secondary level. You could make the same rationale at the child development level, and we are going to pass a major bill in that field this year, and certainly we need more research and demonstration in the child development field, as I am sure you would agree.

You could make the same case for a foundation in the vocational-technical or career field.

You could make the same case in the educational technology field.

You see the road down which you are taking us and the decisions you are pressing upon us, I think, can prove quite damaging and prejudicial to the cause of Federal support for education.

That is just my judgment, and I could be dead wrong and not know what I am talking about, but I must say I certainly haven't had a satisfactory response to my questions on this point yet.

Dr. Martin, let me turn to your testimony. You are making a distinction on page 4 between those functions in the Bureau of Education of the Handicapped, which will continue to be its responsibility and those of its functions which will be transferred to NIE, if I understand the principal purpose of your statement.

Dr. MARTIN. Yes, sir.

Mr. BRADEMAS. I am not clear about the basis of your distinction. On page 4 you say that it is proposed that the distinction be based on projected end products of the activities rather than on arbitrary descriptions of the activities. But if you turn later on in your statement, you seem, on pages 6 and 7, to draw a different distinction; namely, that you would retain within the Bureau of Education of the Handicapped short-term activities while activities with longer run consequences, would be transferred to the NIE.

And you go ahead to define the short term as the specific purpose of improving the education of handicapped children who are, if you look at your statement on page 7, in school today.

So you have given us two different justifications of the distinction between the activities proposed to be transferred, and I am confused.

Dr. MARTIN. I think the first thing is that as with the general transfer of research support to NIE, the funds for education of the handicapped that are basically research funds will be transferred to NIE as will the support of the research and development centers.

The simplest answer for us as we came to terms with this would be to make that line between R. & D. and dissemination and demonstration sharply, but as we thought about the particular characteristics of the program we are trying to run for handicapped children, we wanted to make the decision in that context. Basically, we have been working for several years to tie together, in the Bureau, a comprehensive program focused on a very narrow target group of children, and we have put together specific strategy to try and use the amount of Federal funds, whether they be funds to States under title VI or grants to teacher education or demonstration grants for catalytic purposes.

We have an evolving Federal strategy based on this concept which is now impacting on $200 million, but even at $200 million it is a $30 per chid grant, and so the funds must be seen as a catalyst rather than per child subsidy

What I am saying is that in order to have available the kind of information we need to make judgments about what kind of teacher education investments we are going to make, or how our investment should be made in a specific program, like serving 3,000 or 4,000 deaf and blind children, we felt we might need certain kinds of short-term policy research for answers.

For example, right now we have had the task of educating deaf and blind children who were born as a result of the rubella epidemic. These youngsters are now 5 and 6 years of age. There are 4,000 of them. A few years ago there was only 100 in educational placements. We have had a direct grant program stimulating in this area and as a result there are now 1,000 children in classes. This year when our committee on deaf-blind centers came in, they said to us, "We wish you would test out a couple of the major procedures being employed here and give us a feeling whether these are the ones we should stimulate the development of."

We can make an immediate response to that at the present time. We can ask Dr. Moss to find researchers to immediately do that, to get us the kind of information that would be related quickly to the change of policy and funding. That is really what I was trying to say.

I agree with you as I read the semantics of it, the notion long-term versus short-term did not seem to be a full explanation of what we were trying to do. What we were proposing is that there are some kinds of short-term policy related or investment related decisions that we can continue to do research toward under our research authority.

They fall generally in these characteristics of evaluation kind of research or what I would call administrative policy research.

Mr. BRADEMAS. Well, I would just make two observations and ask one more brief question and then yield to Mr. Quie.

I think this has been very helpful and stimulating to me to get your responses on these questions, extremely helpful. The impression I have, however, is that there is a good deal more work to be done down at the Office of Education on who is going to be doing what. I would express the hope, though everybody likes to take care of his own backyard, not least of all Members of Congress, that you try to refine as thoughtfully and sensitively and perceptively as I know will be your purpose just who will have responsibility for what aspect of the whole spectrum of educational R. & D. and dissemination.

If you look at the bill, by the way, on page 2, you will see it says:

> The purpose of this Act is to establish a National Institute of Education to conduct and support educational research and disseminate educational research findings throughout the nation. As used in this Act the term "educational research" includes research, planning, surveys, evaluations, investigations, experiments, developments, and demonstrations in the field of education.

I didn't write this bill, as you know. You all wrote the bill. I am just reading your bill back to you.

I guess all I am saying is that I hope there is not so much preoccupation with retention of authorities that we will diminish the capacity of the proposed NIE to do what I think we would all like it to do.

Dr. Davies, how many will be the new slots authorized in terms of staff for NIE and how many would be transferred, or are you that far along in your planning?

Dr. DAVIES. We are not that far along, but we do have the specific task on the agenda for the planning unit to work out both the process for consideration of who and how many will be transferred. We need to take into consideration both the pertinent civil service regulations as well as human concerns about individuals. The planning unit has the responsibility for presenting to me and to the Commissioner a staffing plan which would include the number of people required to do the task. It would be premature to give you a figure at this point, however.

Mr. BRADEMAS. Thank you.

Mr. Quie.

Mr. QUIE. Thank you, Mr. Chairman.

I would like to first start with Ed Martin regarding the handicapped.

I get the feeling in reading your testimony that NIE will be engaged in research for the handicapped, but the Bureau of Handicapped will continue to have an innovative experimental program, will continue to do some research themselves and disseminate it, is that right?

Dr. MARTIN. That is right. But the kind of research would be sharply limited so as to not overlap with what NIE is doing. It is a similar pattern to the kind we follow in training with Bureau of Educational and Professional Development where we have divided up between us those things that are most appropriate to their missions and those things which are most appropriate to ours and so we work out plans.

Mr. QUIE. Would BEH do innovation instead of the Institute for areas of the handicapped, as the Foundation's relationship to the Institute would be for higher education?

I guess I better ask Dr. Davies that.

Dr. MARTIN. Maybe so. I can't speak as well on the Foundation.

Dr. DAVIES. Partly; although BEH would have other functions. It provides support money for operations for services for children. The Foundation would not be engaged in that.

Mr. QUIE. But as far as the programs beyond research, innovation, experimental programs and new concepts and dissemination that the Foundation is going to be involved in for higher education, is that what BEH is going to be doing for the handicapped?

Dr. MARTIN. We are trying to use all of our money, Mr. Quie, the grants to the States under title VI, various teacher training grants and so forth, as some kind of catalytic reform agent in the field because of the magnitude of the funds simply doesn't allow them to provide service grants for every handicapped child.

In order to do that we have had to develop several kinds of innovative or model or demonstration programs that provide that kind of glue for other programs.

The model preschool program and things of this kind I would hope would play that function. That is why we are pleased to have that authority available to us to continue that.

Mr. QUIE. You feel then that for the same reason that we have set up a bureau that we ought to continue the separate functions for the handicapped?

Dr. MARTIN. I think we can have the best of both worlds, and this is what we have tried to do in working out this arrangement. I think it is valuable for handicapped children to have National Institute for Education doing research on them and doing basic research into learning and language development.

I think it is of particular importance to me that the people interested in research in regular education take some responsibility for thinking about handicapped children in those kinds of research activities and building them in.

I am delighted, for example, in one of the three experimental schools the population of handicapped children in that project will be served within the parameters of the experimental school program. At the same time it seems to me that our catalytic strategy requires us to have flexibility to make instant and immediate policy kinds of research grants to tie together our other funding strategies or to change the shape of our pattern.

Those are not the kinds of things that would be probably a very high priority to a broad-scale research institute, but that might be very relevant to the needs of 4,000 deaf-blind kids. That is where we are trying to have the capacity to go each way.

Mr. QUIE. Let me ask you what has been your experience when we started earmarking the funds on the one hand, and then what happened under the Research Act where it seems to me there was a reduction of assistance for handicapped once it got started.

Dr. MARTIN. We have had that problem. When Cooperative Research was first started, it was earmarked two-thirds for mental retardation. It continued that way for 2 years. After that, when the set-aside was taken off, funding dropped to 3 or 5 percent of overall expenditure.

It was then that Congress passed the research and demonstration authority which still exists in education for the handicapped.

As you well know, Mr. Quie, title III has been a continuing problem that people interested in education of the handicapped when faced.

Again I think our proposal helps to guard against that problem. It maintains an authority that can be used and on the other hand builds a very strong commitment to handicapped children into NIE, so I think we will be safeguarded both ways.

Mr. QUIE. There is no earmarking or set-aside in NIE?

Dr. MARTIN. No; we don't have that kind of a set-aside.

Mr. QUIE. Well, some of us will watch it closely. I hope we can pass it, and we will watch closely to see that the same thing doesn't happen to the handicapped in NIE that happened under the Research Act.

Dr. MARTIN. I think that is less likely to happen now that the Commissioner has made education of the handicapped a priority concern, because I think those kinds of problems can only happen if there is not a priority involved.

As long as there is a stated priority that cuts across not just our Bureau but all of the programs that the Commissioner would administer, I think we would be less likely to have that problem.

Mr. QUIE. What has been the relationship of the Rehabilitation Services Administration in NIH?

Dr. MARTIN. I think I am not an expert on either of those two programs, but basically Rehab does the kind of research that we do, research that we now do that is immediately related to rehabilitating

people to training them, to discipline procedures that are of that kind where NIH has been doing the basic health related research that underlies the rehabilitation process.

I think to some extent we will have an analogous relationship between NIE and BEH as a possibility.

Mr. QUIE. Was it expected that when the administration wrote the proposal and sent it down that BEH would have the same relationship to NIE that the rehabilitation services now has to NIH?

Dr. MARTIN. I can't say that necessarily was a factor, Mr. Quie. That particular analogy is an interesting one. It tends to sort out on an applied versus basic foundation. That is the relationship we have had with NCERD recently where they have not funded applied research for education of the handicapped, and we have, but projects that NCERD has funded such as individually prescribed instruction have occasionally been stretched to serve handicapped children.

Sometimes we have provided additional funding. We have made additional grants to computer-assisted instruction programs extended to deaf children, and we have quite a large grant there.

Similarly in the early childhood labs program we made additional grant to have early childhood lab specialize in education to the handicapped. I think a case could be made for some kind of analogous arrangement.

Mr. QUIE. What has been the experience of the Bureau in attracting proposals from people outside of special education?

Dr. MARTIN. We have been successful in doing that and we have also found it very necessary to do it. It seems to me that this could be one of the benefits that NIE will have again in relation to other areas of social science research that it will be able to attract those programs.

We have grants now to the Electrical Engineering Department at Stanford. We have grants to cybernetic research people who developed space and defense technology. We have a grant with Argonne Labs in Chicago to do another kind of thing, and we are in the process of pulling together a paper contributed by about half a dozen of the leading experimental psychologists in the country as to impact of experimental psychology on handicaped children.

It is one of the things we are most proud of, and it has been very necessary for us to take that tactic in order to supplement the number of people who are able and who are willing to do research in education of the handicapped.

Mr. QUIE. Do you expect you will be able to continue to do that once NIE is established?

Dr. MARTIN. I would hope so. In the planning discussions we have had with NIE planning group, we have raised this and a number of other questions and felt very good about the kind of relationship that should be possible between NIE and BEH in this area and in a number of areas.

Mr. QUIE. Dr. Davies, a little bit ago I asked a question if similar relationships would exist between BEH and NIE as the Foundation would have with NIE. Are there any other areas of education where the kind of innovation, experimental activities will continue outside of NIE like it is with the handicapped and higher education if the administration proposal goes through?

Dr. DAVIES. There are several areas in the Office of Education. The Bureau of Educational Personnel Development will continue to stress reform and change in teacher training both in schools and in colleges in the same way that it has I think it will benefit a good deal from the results of the work of the Institute of Education, but will continue to try to find appropriate ways to use training as the way of installing good practice.

Training, we have often maintained, is the most effective forum of dissemination. It is through the teacher and the change in the teacher's behavior that you get new ideas in the classroom.

That is one example of a program that would continue its reform and renewal mission and would benefit from the establishment of NIE. There are others, also.

Mr. QUIE. What about vocational education? Is there anybody here who is specifically concerned with vocational education?

Dr. DAVIES. Yes; Dr. Silberman, who is Associate Commissioner for National Center for Educational Research and Development, administers the vocational educational research program that is administered in NCERD.

Mr. QUIE. What will be the relation to vocational education since you are going to transfer research responsibility under the present act over to NIE?

Dr. SILBERMAN. Currently the Center for Educational Research does have a fairly good relationship with the Adult and Vocational Education Bureau and, while we carry on the research program, we do in fact coordinate our activities with their operating formula grant programs.

Mr. QUIE. When NIE is established, will the Bureau continue to have the same responsibilities for vocational education just as BEH has for handicapped and as the foundation has for higher education?

Dr. SILBERMAN. No, I don't think so. I think BEH has a history of having R. & D. program on-going and they have been quite successful. In the case of vocational education, the research has been conducted centrally in the research bureau.

Dr. DAVIES. I could say to add to that, Mr. Quie, that the Bureau does want to give to the Bureau of Adult and Vocational Education some capacity on innovation and development of new approaches in the field. This would not be research and development capacity, we are concerned that that Bureau have an opportunity to provide leadership in its field.

Mr. QUIE. I can see from Dr. Martin's answers that there is a good likelihood that they will protect the interests of the handicapped the way it is established, and I understand that the Foundation is going to do the same thing for higher education. I am still not certain how vocational education is going to be protected because it is my belief that they have been on the short end of the stick when it comes to research, and in fact most everything in the Office of Education.

Dr. DAVIES. Actually vocational education—and I might note that Commissioner Marland has been using the term "career education"—has been established as a major priority for the Office of Education. That is the first time I can remember this happening. Career education research and development is a major priority for this year and the next year.

Mr. BRADEMAS. Will my colleague yield?

Perhaps he will consider cosponsoring with me a bill for establishing a National Foundation for Career Education.

Mr. QUIE. I can tell you that I have been thinking about it.

I have to get you convinced to support the National Foundation for Higher Education first.

What about these new programs that Mr. Marland is talking about, the experimental or pilot programs in vocational education? Who will administer those?

I understand that three of them are going to be established. Am I correct on that? Are there more planned for the future?

Dr. SILBERMAN. This is R. & D. program to promote career development, and its purpose is to try to integrate the general educational programs of the schools with the vocational education programs which thus far, have been separate.

Mr. QUIE. Have the areas been selected, the locations selected for any of these?

Mr. SILBERMAN. No; they have not.

Mr. QUIE. When do you expect the announcement of that?

Dr. SILBERMAN. We expect to do quite a bit of planning; currently, we are soliciting resources to assist us in conducting the planning.

With respect to the school-based model, we are soliciting recommendations of the best current practices from the research coordinating units and State vocational education directors around the country, and we probably will cap-stone one to three outstanding local programs. We are now compiling a list of exemplary programs in career development for this model.

Dr. SILBERMAN. We expect to have this list compiled in another 2 weeks, and we expect to let a planning grant before the end of June.

Mr. QUIE. How long will it take before we will have the kind of information that the Office of Education feels is necessary to expand the Federal efforts of vocational education, which I understand Commissioner Marland would expect to do sometime later? What is the time span here?

Dr. SILBERMAN. Our plan is to launch the three career development models this year, and continue careful planning through next year. Then, when we know what works best and have working models that are effective, we may come through with a proposal for a greatly expanded program of career development.

Mr. QUIE. Next year for fiscal 1973?

Mr. SILBERMAN. We will collect information to come up with a plan for 1973. I don't think the models will be fully developed in 1973.

Mr. QUIE. When?

Dr. SILBERMAN. Are you asking me when legislation will be coming through?

Mr. QUIE. Yes.

Dr. SILBERMAN. I don't know, perhaps by 1974.

Mr. QUIE. I hope it won't be until 1974. That is a long time away. I understand that, when NIE is established, the first year you will spend $3 million for planning and from your testimony, Dr. Davies, you indicated that you can't tell very much as to the planning until you get a director in place.

Dr. DAVIES. I missed the latter part of your question, Mr. Quie.

Mr. QUIE. I say as part of any explanation of what the planning will be, you will wait until the director is in place, is that correct?

Dr. DAVIES. The planning unit has a work plan which we are going to submit to the committee for the record. They will be producing a number of things as they go along which will be very useful in the form of recommendations for the Commissioner and for the new director once he is selected, so he will be able to have a running start and won't have to start from page 1 doing analytical work that is necessary to start an agency such as this.

Three million dollars is in fiscal 1972 budget, which would carry us over to fiscal 1973 which would be the first year operating funds for NIE would be available.

Mr. QUIE. How many people would be involved in the first year?

Dr. DAVIES. The planning unit presently has four professionals. We are going to add an additional six and seven people. We will have 10 or 12 people involved in this effort at least between now and December or January. Once the director is selected, he will gradually add to that planning unit so that he will have a substantial nucleus of people who can become a part of the National Institute of Education when it becomes an operating agency.

Mr. QUIE. How many people in the planning unit will be transferred from the Office of Education and how many will be new?

Dr. DAVIES. We can't answer that question at the moment. As I indicated to the chairman, the planning unit has the responsibility as one of its tasks to develop a staffing pattern, and then to develop a process that will deal with the question of how many people will be transferred from OE and who they are going to be.

Mr. QUIE. Thank you. I appreciate your testimony. You, too, John. I gathered you were asking questions on the experimental schools, and I assume you asked all of them so I won't go into all of them.

Mr. BRADEMAS. I don't know that I asked all of them. As a matter of fact, I have two or three more now.

Dr. Davies, to what extent do you, in view of the fact that the administration commissioned it, to what extent does the report of Dr. Levien represent the purpose and structure of the NIE as you and the administration conceive it?

Dr. DAVIES. Dr. Levien's report, which has been very well received in the field, provides a very good takeoff point for the planning unit which Dr. Silberman heads. They are not bound by the recommendations in the Levien report, but they studied it and are using it in great detail, but they are not starting with the assumption that everything in that report is going to be what they finally recommend.

Mr. BRADEMAS. I must congratulate the administration in this respect on having initiated a searching study of a proposal that was to be sent to Congress. This is one of the few times I have seen this done under any administration, and I think it is especially commendable in so significant an area where we have a lot of unresolved questions.

Dr. Levien's report is invaluable.

Dr. DAVIES. I could also point out that we have made an arrangement which will make it possible for Dr. Levien to continue to offer advice and consultation to the planning unit as they move along during this next year.

Mr. BRADEMAS. I am happy to hear that.

Dr. Lamkin, your research priorities at the moment as I understand it in your own area of responsibility would be libraries. Can you make any comments on new work in the information sciences field or the educational technology field that you would hope, if your own priorities were attended to, could be undertaken by the NIE?

STATEMENT OF BURTON E. LAMKIN, ASSOCIATE COMMISSIONER, BUREAU OF LIBRARY AND EDUCATIONAL TECHNOLOGY, OFFICE OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Dr. LAMKIN. We look forward, Mr. Chairman, with great anticipation to the formation of NIE because we believe the research program that we currently administer in the Bureau of Libraries and Educational Technology has not been able to properly address the major research needs we have in libraries, information science, and educational technology. So I look to NIE as being the resource that we will depend on to provide the basic research that we need in this field.

If I might give an example, in the past we have supported many small endeavors undertaken by researchers to come up with various different types of research results. With the level of funding that we have been able to use for these purposes, we have found that this had very little Federal impact.

As a result, we have had to shift our emphasis from fragmenting and supporting small projects to attempting to launch several major demonstrations where we could actually show and communicate how libraries, technologies or instructional resources in general can be used to further support reform in the educational system.

Therefore, we are not using any of our funds at this time to support library information science type research endeavors, and we expect the NIE to take on this responsibility.

Mr. BRADEMAS. You are rather different in this respect from some of the other bureaus in OE which apparently do have some funds earmarked for research. Is that correct?

Dr. LAMKIN. We do have funds earmarked for research, yes, in the broad context. We consider a planning component, a demonstration component and developmental activities along these lines to be the way in which we exercise our research authority.

Mr. BRADEMAS. I wonder if, Dr. Davies, you could comment on just a couple of other questions before we conclude here.

I take it from what has been said that the several activities which are represented here today and others that may not be represented from OE will be carrying on a degree of what could be called research within their own shops, although the main focus of R. & D. would now be established in NIE. Is that correct?

Dr. DAVIES. Yes; with all of the limitations that Ed Martin provided on delineating that research role, and in most of the things that we would be talking about, research would not be the accurate term.

Mr. BRADEMAS. Given the various responsibilities of the shops within the Office of Education, how will priorities be determined for research to be supported by the NIE?

In other words, I should have thought that, given a finite sum of money, there will be, as is always the case and it is quite appropriate, a competition for those funds. Who is going to decide what kind of research ought to be undertaken? What kind of mechanism do you presently envisage for making those judgments, and what kinds of mechanisms do you contemplate for the ongoing relationships between the present constituent parts of OE and the proposed NIE?

Dr. DAVIES. On the former question, this is one of the most important parts of the work of the planning unit, to develop recommended processes for identifying the most important problems needing solution and setting up a process for setting priorities. Harry, or members of the planning unit, might want to comment further about that. I assume you are talking about NIE, how are they going to write priorities.

The planning unit now, as you will see in this work plan, are going to give a very substantial attention to that question.

Dr. SILBERMAN. I would guess this would involve conversations and discussions and conferences with a very wide number of people across the country.

Mr. BRADEMAS. Would you repeat that? I am sorry.

Dr. SILBERMAN. I am saying, trying to determine priorities involves getting concensus by talking to a large number of people across the country and getting people to have a dialog, talking about what things are more important in the way of current pressing problems.

These specific programs are probably going to be determined by the analysis of the general problem areas that are identified through these discussions.

Mr. BRADEMAS. That is putting it in the passive tense. Let me have a transitive verb. Who is going to be doing the deciding?

Dr. SILBERMAN. I would expect there will be a policy group, your National Advisory Council, that will provide guidance to the Director of NIE as to priorities. They should provide guidance to NIE about the problem areas that are most important.

Dr. DAVIES. Of course, this is also a place where the kind of interchange between OE and NIE becomes important and the kind of interchange between those of those agencies and the field, so both agencies are being as well informed as possible as to what the real problems are.

I would expect that the Commissioner would want to take a very important and active role in that priority establishment process.

Mr. BRADEMAS. I would hope and I am sure that is the case, that your planning group will be giving very careful attention to the questions of the relationships between the Commissioner and the Director, and the relationships between operating programs in OE and the research and development programs in NIE and to who makes decisions, and to how those decisions are made.

You have given me rather general responses, by which I take you to be saying that these are matters on which you are presently working and have not yet totally resolved.

Dr. DAVIES. That is right. On the point of relationships between operating units and NIE, we hope to establish a kind of model for that in the planning process itself by having the representatives that you see before you plus other representatives of the operating units

work very closely with the planning unit on all matters in which there are some mutual interest.

Mr. BRADEMAS. A final question. We have not said anything here today that would indicate that there would be relationships between other Federal agencies that might be engaged in research and development that would have a bearing on the learning process and the work of the NIE. I should therefore invite your comment on the question of whether NIE people will be talking to, let's say, National Science Foundation personnel or Department of Defense people engaged in educational research, or to researchers at the National Institutes of Health?

Indeed, I should not be surprised that we would be expecting a good deal of research about the learning process coming out of NIH in the years immediately ahead.

Do you have any comment on that question?

Dr. DAVIES. Yes; such conversations and review of programs will go on not only during the planning period but also after NIE is established. It would seem to be essential if it is going to be effective not to wall itself off from other research enterprises, particularly since it is our intent to have as broad a base of research interest in NIE as possible, that they will have much in common with researchers and developers in other agencies.

That kind of relationship and program review will begin with a planning unit now and will continue then after the NIE becomes established.

Mr. BRADEMAS. I might say by way of concluding, Dr. Davies, that as soon as you have developed that model, you might consider talking about it with members of this committee in any event. I say that not because we are naturally nosey, but to reiterate my own conviction that the National Institute of Education is an opportunity of such constructive potential for education in this country that I hope that there can be the closest cooperation not only across party lines but between the executive and legislative branches in refining and shaping the concept. My own conviction is, as I know you are aware, that if we are really to generate substantial support for educational research and development in Congress, we are going to need to understand as fully as we can just what it is we are talking about. So I hope very much that we shall be able to continue the kind of extremely valuable conversation that we have had here this morning, and I want again to express my own appreciation and that of Mr. Quie to all of you for having allowed us to put so many questions to you and having elicited from you so many useful responses. Thank you very much.

Dr. DAVIES. Thank you very much. We appreciate your interest.

Mr. BRADEMAS. Thank you. We are adjourned.

(The following articles were submitted for the record:)

RESPONSES TO REPRESENTATIVE BRADEMAS' QUESTIONS BY LEE G. BURCHINAL, ASSISTANT COMMISSIONER, NATIONAL CENTER FOR EDUCATIONAL COMMUNICATION, OFFICE OF EDUCATION, HEW

WHAT TECHNIQUES OF NCEC CAN BEST BE CARRIED OUT BY NIE?

The function now being performed by NCEC which can best be performed by NIE is that of research and development on dissemination and utilization of scientific knowledge about education. What is needed is increased research and

development on factors which facilitate or inhibit change in educational organizations, design of major new alternatives for communication of the results of research and development to educational agencies, and assessment of current knowledge utilization practices in education. NCEC, on the other hand, would stress enhancement and utilization of current mechanisms and instrumentalities for educational communication and apply the results of NIE research and development on dissemination in improved spread and adoption of validated alternatives to current educational practice.

HOW DO YOU THINK COOPERATION BETWEEN NIE AND NCEC CAN BEST GO FORWARD?

Cooperation between NIE and NCEC can expand easily from the already established joint activities between NCEC and NCERD. NCEC can provide a dissemination outlet for all NIE documents through ERIC and can also assure complete access to the knowledge base in education to NIE by providing information services from ERIC and the Educational Reference Center. NCEC also provides an effective mechanism for fostering communication and installation of the products of NIE in operating educational settings. This will be done (as is currently the case) by enlisting the resources of other organizational units reporting to the Deputy Commissioner for Development and other Bureaus of the Office of Education. (During the current fiscal year, NCEC is supporting dissemination and installation of 10 tested R&D products). Such efforts must be based on early and continuous formal planning arrangements, even during the early development stages for complex products, so that NCEC and other parts of the Office may plan dissemination and installation strategies and program funds for later fiscal years. The resulting dissemination programs are implemented by thorough close interaction literally daily—between the two staffs.

Our successful experience could be elaborated as a guide to NIE–NCEC cooperation by:

1. Establishing formal joint planning between NIE and NCEC with dissemination and installation interests in OE included.

2. Arranging for joint NIE–OE staff work in planning, developing, and monitoring programs so that R&D results can be moved readily from development to wide installation.

3. Exchanging staff between NIE and OE so that each group can develop confidence and understanding in the others' policies and activities.

HOW WILL PRIORITIES BE DECIDED BY YOUR PROGRAM AND PRIORITIES SET BY NIE BE RESOLVED? WILL YOU HAVE ANY SAY IN DECIDING PRIORITIES?

A major instrumentality for mutual accommodation of NIE and OE policies resides in the Commissioner of Education, who can weigh and balance the differing interests and needs of the research and development and the educational practice communities. Perhaps the key OE staff position in such articulation of plans is the Deputy Commissioner for Development, who is responsible for dissemination, statistics, educational personnel development, and related activities focused on bringing about educational change. In addition, since both agencies will be addressing themselves to a single set of national goals and priorities, some degree of consensus will emerge. Third, and more concretely, both agencies will be operating under the Departmental Operational Planning System and will therefore be concentrating a major portion of their resources on identical priorities. Finally, formal joint planning through the NIE Advisory Board will commit both OE and NIE to support of major innovations and their national use.

RESPONSES TO REPRESENTATIVE BRADEMAS' QUESTIONS BY EDWIN W. MARTIN, ASSOCIATE COMMISSIONER

1. What problems have been caused in the past by a general research agency having responsibility for research in education of handicapped children?

The problems were related to priorities and individual interests. There are so many educational problems which require attention that the problems of handicapped children were generally given a low priority. When the Cooperative Research Act was originally funded, two thirds of the funds were earmarked for research on mental retardation. The earmarking was removed after two years and the amount invested in all areas of the handicapped quickly dropped to less than five percent. In contrast to this, support for research on handicapped chil-

dren increased by a factor of 15 when the responsibility for research budgeting was a part of a larger program specifically concerned with the handicapped.

2. What is the Special Education Instructional Materials Center Network? Is it unique—is there a similar general education network?

Isn't this an example of the value of research support being closely related to operational programs?

The Special Education Instructional Materials Center Network began in 1964 as a demonstration project to show how to help teachers of handicapped children keep up with new teaching materials. The project was so successful that it was enlarged into a network of Regional Centers. As these centers became successful they were copied at the State and local levels until today there are over 300 centers scattered across the Nation. These centers all work together to share information, thus making it possible for information to flow two ways, from the national network office down to individual teachers and from individual teachers up to the national office and from there to the U.S. Office of Education.

We know of nothing similar in regular education. Ultimately those concerned with the problems of communicating to teachers in regular classrooms may build upon this network for that purpose.

This is a good example of the value of keeping research support closely related to operational programs. The network could not have developed as quickly were it not for the cooperation of other administrative units concerned with handicapped children. The training of personnel to manage the 300 local centers was assisted by the fellowship funds administered by a Division of Personnel Training and the operation of many of the local centers is supported by other related programs managed by the Bureau of Education for the Handicapped.

3. Why has it been necessary for Congress to mandate the creation of the Bureau of Education of the Handicapped and to specify the participation of handicapped children in the Vocational Education Act, Title III of ESEA, etc.?

Historically, relatively few people have been interested in the problems of handicapped children. School administrators and program managers at various levels often pay token attention to the problems of these children and then often because of pressures generated by parents or legislators. Public school administrators rarely develop programs for handicapped children unless State laws require such programs or the cost of such programs is substantially reimbursed by non-local funds. Administrators at State and Federal levels are generally concerned with the broader issues of education and attend directly to such issues. Thus, it has been unusual for administrators to move by themselves to organize, promote and support programs for handicapped children. Because of this, the Congress considered it necessary to mandate that funds be earmarked for the education of handicapped children and that a reasonable structure be established in the U.S. Office of Education to permit a coordinated effort to bring more effective services to these children.

4. Give an example of the close working relationship between research, teacher education and actual classroom instruction support programs in the Bureau of Education for the Handicapped.

The best single example of this occurred with visually impaired children. Three research projects had demonstrated quite conclusively that many children who are considered blind actually have residual vision which could be useful if the children could be taught to use it. Actual teaching systems and materials were developed as a part of the research. The results of the research were disseminated in the traditional manner and the staff of the Division of Research assumed that people were changing their approaches to these children in light of the new findings. This was a false assumption. When the Division staff discovered that people were ignoring the result findings, steps were taken to correct the situation.

The problem was to retrain teachers of blind children across the country. To do this required the cooperation of all of the units of the Bureau of Education for the Handicapped. The challenge was made by the Division of Research to the professionals making up the field of the blind. The challenge was to have every child with low vision receiving appropriate services within one year of the date of the challenge. The management of the problem was turned over to a staff member in the Division of Personnel Training effort. A conference grant was made through the research division to train area representatives in the use of materials. The Instructional Materials Center in Louisville, Kentucky, supported through research funds, was asked to prepare materials necessary for the program.

Regional workshops were held around the country, supported in part from funds administered by the Division of Personnel Training. Since most of the children are located in State Residential schools for the blind, funds appropriated under P.L. 89–313, administered by the Division of Educational Services, were used to buy materials necessary to implement the program. Graduate students at the University of Texas, supported through Bureau training funds are engaging in research to examine the process to determine if it might serve as a model for other attempts to bring about changes in the educational system. In summary, the implementation of the program required the commitment of funds and manpower from every operating Division within the Bureau.

The job wasn't completed in the 12 months proposed, rather it took 16 months.

Experimental Schools Program—U.S. Office of Education

Experimental Schools is a new program in the Office of Education. It was introduced by President Nixon in his Message on Educational Reform (March 1970) when he called for such a program to be a "bridge between basic educational research and actual school practices".

By supporting a small number of large-scale comprehensive experiments with a major focus on documentation and evaluation, Experimental Schools serves as a successful bridge from research, demonstration, and experimentation to actual practice.

In response to the President's message, the Congress appropriated $12 million for Fiscal Year 1971.

When Sidney P. Marland, Jr., was appointed U.S. Commissioner of Education December 17, 1970, he announced that rapid implementation of the Experimental Schools program was one of his highest priorities. On December 28, 1970, some 20,000 copies of the first announcement regarding this new program were distributed nationwide.

The announcement set forth the general policies that were established specifically for governing the first projects and it solicited letters of interest from all agencies interested and able to combine into a single, comprehensive, kindergarten through grade 12 project a wide variety of promising practices for 2,000 to 5,000 predominantly low-income family children.

By February 1, 1971, nearly 500 letters of interest had been sent to the Experimental Schools office. An independent selection committee recommended eight, which, in its judgment in cooperation with the Experimental Schools staff, had put together the most creative and most significant combinations of promising practices that could be fully operational in September, 1971. Each of the eight sites was given a 60-day planning grant to work out comprehensive programs meeting all the requirements laid out in the first announcement entitled—*Basic Program Information: Experimental Schools.*

The eight agencies which received the $10,000 planning grants were:

Austin, Texas, Independent School District
Berkeley, California, Unified School District
Ferguson-Florissant, Missouri, School District
Franklin Pierce, Washington, School District
McComb, Mississippi, Public Schools
Minneapolis, Minnesota, Public Schools
Portland, Oregon, Public Schools
Rochester, New York, City School District

A distinguished panel reviewed the eight proposals and on April 10, 1971, selected three to be Experimental School sites: Berkeley Unified School District; Franklin Pierce School District; and the Minneapolis Public Schools.

Each of the three sites developed its own unique program, each has met the Experimental Schools requirements in ways which suit the particular needs of the communities involved, and each has combined a variety of promising practices into a comprehensive K–12 school design.

The plans are complex. They encourage flexibility. They allow for change and adaptability as progress reports and interim results show the need for changes in direction and/or emphasis.

Recognizing the need for long-term assessment, each Experimental School site is funded for five years of operation; first for 30 months to be followed by additional funding for the final 30 months. On June 1, 1971, thirty-month operational grants in the following amounts were awarded to:

Berkeley	\$3,639,063
Franklin Pierce	\$2,462,718
Minneapolis	\$3,580,877

The Berkeley, Franklin Pierce, and Minneapolis projects should not be viewed as models. Each was developed out of the experience, the history, and the special characteristics of a particular site at a particular time—the spring of 1971.

The Experimental Schools program expects to have a limited number of new starts in each of the next five years. During the life of the program, it is the intent of the U.S. Office of Education to support a wide variety of comprehensive experiments. Thus, the requirements, procedures, format, and criteria used to select Experimental School sites will evolve and change from year to year.

As a major component in the proposed National Institute of Education, the Experimental Schools program is designed to increase and improve basic knowledge about the process of education and to implement on a wide scale significant concepts derived from research done in a "real world" setting.

In the past, Federal research activities in education have concentrated heavily on single programs such as staffing, curriculum and the use of technology.

Results from such piecemeal experimentation have been disappointing; few significant changes have been implemented. The thrust of the first three Experimental School sites is comprehensiveness in all grades K–12. Numbers are limited to a minimum of 2,000 and a maximum of 5,000. The comprehensive designs emphasize compatible and mutually reinforcing curriculum reform, staff training, administrative reorganization, community participation, and evaluation strategies.

The Experimental Schools program fulfilled its priority mandate to have programs in operation in September 1971, despite its late activation (December 17, 1970). Experimental Schools initiated 3 projects, operational September 1971, involving over 11,000 students over 65% from low-income families. The three projects derived from research, demonstration and experimentation in a comprehensive education program.

Among those practices considered most promising by FY '71 projects were: "Patterns in Arithmetic" (a media/programmed approach to individualized math instruction) developed by the Northwest Regional Laboratory; Bilingual materials developed by Title VII grant to Tucson, Arizona Public Schools; "Man, A Course of Study" developed by an NSF award to Educational Development Corporation (EDC); "Collaborative Problem Solving" developed by an EPDA grant; "Individually Prescribed Instruction" developed by Research for Better Schools in Pittsburgh, Pennsylvania; "Work Opportunity Centers" developed by Vocational Education Bureau and Title III funds; Environmental Science Center developed by Title III; the Charette (an organizational technique) developed by the Facilities Branch of USOE: Child Development Center developed by the Follow Through program of USOE; and the "Pyramid Reading Program" developed by the University of Minnesota under a Title IV grant. These practices illustrate the movement of ideas developed by Federally-supported research programs into wider practices. The three are located in the Berkeley Unified School District, Berkeley, California; the Franklin-Pierce School District, Pierce County, Washington; and the Minneapolis Public Schools, Minneapolis, Minnesota.

Because of the complexity of their programs and because of their ambitious goals, any one or all three of them may fail to achieve success. But regardless of the degree of achievement overall—or for any of the components—the three sites represent nationally significant comprehensive educational experiments.

Together these first three, and those to come, promise to give a test to the idea of combining several promising practices into a comprehensive, coherent, articulated educational program.

It is imperative that the evaluation and documentation procedures be comprehensive and thorough. Therefore within each five-year program is a special evaluation design. This internal assessment provides for the basic tracking of student progress and for the collecting of vital data. This level of evaluation takes place within an Experimental Schools project site and is conducted by the project staff.

Evaluation on a second level is also specific to an individual site but it is carried out by an evaluation contractor who is external to the project staff. For example, the Human Action Research Institute, Los Angeles, California, has a $748,316 thirty-month contract to evaluate and document the Berkeley site; the Northwest Regional Educational Laboratory, Portland, Oregon, has a $523,236 thirty-month contract for evaluation and documentation of the Franklin Pierce site; and the Aries Corporation, Minneapolis, Minnesota, has a $526,051 thirty-month contract for evaluation and documentation of the Minneapolis site.

The third level of evaluation includes an omnibus evaluator whose activities take in all projects and all sites and whose concerns include replicability of practices and programs, assessment of the second level evaluation activities, and the success of the Experimental Schools program as a whole.

The Experimental Schools program is designed as an evolving program in order to encompass the newest educational ideas as well as avoid the administrative rigidity and program inflexibility that seems to accompany the creation of new units. It is designed as a terminal program yet constantly revising and reviewing its annual focus. Thus, in the fast start accomplished in FY '71 two competitions were necessary: the first, for projects to be operational in September 1971, and the second, for projects to receive sufficient planning and development time to be ready for operation in September 1972.

On March 31, 1971, a second competition was announced by the Experimental Schools office. The second competition broadened the Experimental Schools program by soliciting proposals for comprehensive projects which represent significant alternatives to existing school organization, practice and traditional performance. Applicants were asked to shift their focus and look anew at what students ought to learn, how to make different use of time and space, to rethink staffing patterns and personnel requirements, to consider alternative ways to organize and administer the schools, and to include the community in active participation in educational decisions. The second announcement was sent out nationwide and more than 300 substantive letters of interest were submitted. An independent selection committee chose the following to receive $30.000–$40,000 four-month planning grants to prepare a complete proposal:

- Chicago Public Schools, Chicago, Illinois
- City School District of New Rochelle, New Rochelle. New York
- Edgewood Independent School District, Edgewood, Texas
- Federation of Independent Community Schools, Milwaukee, Wisconsin
- Newark Board of Education. Newark, New Jersey
- Public School System of Gary, Gary, Indiana
- School District of Greenville County, Greenville, South Carolina
- University of North Dakota, Grand Fork. North Dakota
- Vermont State Department of Education, Montpelier, Vermont

On December 1, 1971, several of these applicants. after a review of their proposals by an independent panel, will be selected as Experimental School sites. Prior to receiving five-year operational grants in June, each will receive appropriate development funds for the interim.

The Experimental Schools program itself is experimental—it is testing significant alternatives to present government and pedagogical practices. Most notably:

Funding is for something longer than a year, alowing for continuity and internal integrity while testing and retesting possible alternatives;

The target population is large enough to allow for sufficient experimentation but small enough to be thoroughly evaluated and documented;

The choice of curriculum, organization, staffing patterns, and internal evaluation measures are all the choice of local personnel and the community;

Each applicant is required initially to send in a simple letter of interest rather than a professionally prepared proposal;

Once a letter of interest is chosen by an independent selection committee as a possible contender for an operational grant, the U.S. Office of Education provides a planning grant to allow for any necessary technical assistance;

Instead of the evaluation and documentation coming after a project has been completed or well under way, it is an integral part of each Experimental School site from the beginning;

Documentation includes not only the narrow components in a project, but the project itself and the total environment of which it is a part and which it is shaping;

The independent evaluators will use anthropological and sociological measures to identify both what is appearing to succeed and what is appearing to fail sharing both the "hard" and "soft" data with the U.S. Office of Education and the project staff;

The three levels of evaluation ensure integrity in the reporting systems; and

Each site will provide an information center for visitors which will not impinge on the experiment itself yet fully inform all interested parties on the results of the experiment.

Five 12-month grants were awarded July 1, 1971 to five applicants whose letters of interest presented a uniquely promising component which, when further developed, could later become a significant part of a comprehensive program. The one-year grant winners are: School District #9, Browning, Montana: Seaford School District, Seaford, Delaware; Davis County Community School District, Bloomfield, Iowa; West Las Vegas and Las Vegas City School Districts, Las Vegas, New Mexico; and the Greene County Board of Education, Eutaw, Alabama.

In FY '71 and '72 the Experimental Schools program awards were limited almost exclusively to existing K–12 public school agencies as those deemed most ready and able to design comprehensive projects that encompassed the best of promising practices. From the outset, the planning for Experimental Schools resolved to interpret "schools" broadly to include all of education. Thus, future comprehensive projects, restricted to five new starts in a given year, would be developed and designed in the field to take into consideration such relationships as early childhood education and its linkage to K–12 programming, post high-school education and its linkage to K–12 programming, community-based education which may encompass all ages in given community, higher education and its extension as well as new forms of education designed to improve and reform the present practices.

There are already available a number of sources of funds to conduct basic research and pilot or model projects. Many of these activities will be part of the proposed National Institute of Education (NIE). But there are almost no funds available to support the extension of research necessary to build the bridges between basic research and common practice; between clinical testing of an educational theory and its natural use in a real-world educational setting. In recognition of the large number of important completed basic research experiments and the large time lag between their completion and any large scale operationalizing of their ideas and procedures, a limited number of such experiments will be selected to serve as the basis for the development of large-scale comprehensive experiments with emphasis on developing the means for broad implementation including approaches to financial support, staffing, training, organization, and community participation.

(Whereupon, at 12:20 p.m., the subcommittee recessed, subject to the call of the Chair.)

TO ESTABLISH A NATIONAL INSTITUTE OF EDUCATION

MONDAY, JUNE 14, 1971

HOUSE OF REPRESENTATIVES,
SELECT SUBCOMMITTEE ON EDUCATION OF THE
COMMITTEE ON EDUCATION AND LABOR,
Chicago, Ill.

The Select Subcommittee on Education met, pursuant to call, at 10 a.m., in room 204—A, Everett McKinley Dirksen Building, 219 South Dearborn, Chicago, Ill., Hon. John Brademas presiding.

Present: Representatives Brademas (presiding) and Hansen.

Also present: Jack Duncan, counsel; David Lloyd-Jones, subcommittee professional staff; Martin LaVor, subcommittee minority legislative coordinator.

Mr. BRADEMAS. The Select Subcommittee on Education will come to order for the purpose of further consideration of bills H.R. 33 and H.R. 3606 to establish a National Institute of Education.

The Chair would like to observe at the outset of these hearings, I am very pleased my distinguished colleague, a gentleman from Idaho, Mr. Hansen, and I are to be in Chicago today for the purpose of hearing the viewpoints of expert witnesses on the legislation under consideration.

The Chair might also observe, for the benefit of those in the Chicago area that the Committee on Education and Labor of the House of Representatives is divided into seven subcommittees, three of which deal with education.

The chairman of one of the three Education Subcommittees is Mrs. Edith Green, of Oregon, a subcommittee which handles higher education legislation.

The chairman of the second subcommittee, which handles elementary and secondary education and vocational education, is an outstanding Member of the House from Chicago, Congressman Roman Pucinski.

The third Education Subcommittee, the Select Subcommittee on Education, the one which I have the honor to chair which is here today has within its jurisdiction a variety of educational and other measures.

This subcommittee has jurisdiction over the Library Services and Construction Act, the Environmental Education Act, the Drug Abuse Education Act, the National Center on Educational Media and Materials for the Handicapped and the Vocational Rehabilitation Act, the Commission on Libraries and Information Sciences Act, the Older Americans Act, and the National Commission for the Arts and Humanities Act.

We are considering as well the two pieces of legislation this year in addition to the ones I have just enumerated. These are all bills which emanated from this subcommittee in the last Congress and have been enacted into law.

The subcommittee has before it two very important bills. The Chair would like to take advantage of the fact we find ourselves in Chicago to say a word about one, a bill which is the subject of a very lengthy article in this morning's New York Times. It is a bill on which this subcommittee will be meeting tomorrow afternoon in Washington, for the purpose of continuing what in the legislation process we call marking up the bills. Marking up the bill is the stage of the legislative process, which follows the hearings and which represents the actual writing and amending of the bill.

The bill to which the Chair is now making reference is the Comprehensive Child Development Act. The purpose of this bill is to provide educational help, instructional and related services for the very young children in the United States, regardless of their family income.

If one were to put it in oversimplified shorthand one might describe it as Headstart for all children.

There are very many cosponsors in the House of Representatives, and about a third of the Members of the Senate are sponsors of similar legislation.

This is a measure on which the subcommittee conducted hearings last year, in Chicago, in this building.

The Chair invites the attention of witnesses and members of the media to this legislation because it has enormous longrun significance for the people of a great industrial State like this.

Now, the legislation to which we are giving our attention today to establish a National Institute of Education grew out of a message on educational reform, sent to Congress in March of 1970 by President Nixon in which among other measures, the President proposed the establishment of a National Institute of Education. Its purpose would be the support of research and development with respect to all levels of American education from preschool through graduate school including both formal institutions of learning and extraformal institutions of learning.

This subcommittee has heard a number of witnesses in Washington, D.C., beginning with Daniel Patrick Moynihan.

We have in the last month or so visited educational research centers in Paris, Oslo, and Great Britain. It is our hope later this year to visit Poland and the Soviet Union for the purpose of learning how, in that part of the world, change and innovation are built into their educational systems.

Here in Chicago today we are looking forward to hearing from a variety of witnesses, including Dr. Michael Bakalis, superintendent of public instruction for Illinois; Dr. Theodore W. Schultz, professor of economics, University of Chicago; Mr. Sam Mercantini, representing the Indiana superintendent of public instruction, Mr. John Loughlin.

We are looking forward to hearing our first witness today, Mr. James Parton, president of Encyclopaedia Britannica Educational Corp., who I believe will be presenting a statement on behalf of former Senator William Benton, publisher and chairman of Encyclopaedia Britannica and the Encyclopaedia Britannica Educational Corp.

Mr. Parton, we are looking forward with great interest to hearing what you have to say because we are well aware of the contributions

that Senator Benton and Encyclopaedia Britannica and its associated enterprises have made to education in the United States, and indeed, throughout the world.

We are looking forward to hearing from you, sir.

STATEMENT OF JAMES PARTON AND A. N. FELDZAMEN, PRESIDENT, ENCYCLOPAEDIA BRITANNICA EDUCATIONAL CORP., CHICAGO, ILL.

Mr. Parton. Thank you very much for the very gracious introduction, Congressman Brademas. It is an honor to be here with you and Mr. Hansen and the staff on this extremely important measure.

I have with me Dr. Alvin N. Feldzamen, who is vice president and editorial director for films and publications, and, therefore, the creative head of our enterprise and in the best position to answer subsequent questions.

Senator Benton asked me to apologize profusely for not being here himself. He is on his way to Europe, but he was here last week and the paper we are submitting on his behalf runs to 22 pages. I can assure you that he sweated over every word of it, and is wholeheartedly behind it.

Since it is so long, it seemed to me that to be courteous I would excerpt it and summarize it, rather than read the whole document which can be digested at leisure.

Mr. Brademas. Without objection, the entire statement of Senator Benton will be included at this point in the record and I hope you will feel free to excerpt it, Mr. Parton.

(The statement referred to follows:)

Statement of William Benton, Chairman and Publisher, Encyclopaedia Britannica, Inc., and the Encyclopaedia Britannica Educational Corp., Chicago, Ill.

Mr. Chairman and members of the subcommittee, my name is William Benton. I am Publisher and Board Chairman of Encyclopaedia Britannica, Inc., and of the Encyclopaedia Britannica Educational Corporation.

Among the subsidiaries of the former are the G. & C. Merriam Company, the nation's largest dictionary publisher, and Library Resources, Inc., a new ultramicrofiche publisher specializing in reference collections for libraries.

The Britannica companies produce basic reference works, including encyclopedias, dictionaries, and atlases, which appear in virtually every school and library—and are found in the homes of millions of families.

In addition, the Encyclopaedia Britannica Educational Corporation has the specific purpose of producing innovative educational materials for use in the nation's schools; in addition to books and book collections, these include educational motion pictures, filmstrips, transparencies, multimedia programs, and other audio-visual instructional aids in the "software" category which are being increasingly used in schools both here and abroad.

Thus, the primary business of all the Britannica companies is education across a broad spectrum of school and home application, and an equally broad range of media and methods.

For this reason we have the greatest interest in the proposed National Institute of Education, and are grateful for the opportunity to testify in these important hearings.

Moreover, my own personal lifelong interest in education, and attention to its needs and progress, may also be measured by the fact that I am a trustee of six colleges and universities, served as vice-president of the University of Chicago for eight years, and for six years as the United States Ambassador to UNESCO.

In fact, my mother and father were professors, as were my wife and my uncles and aunts.

So, my entire life has been spent in the vineyards of education, and this has been a dominant theme of much of my own labor and thought.

First, let me begin by heartily commending the wisdom and thoroughness of the Subcommittee in holding hearings on this subject in Chicago. For this city is truly the center of a major segment of the industry that produces and distributes the educational materials used by the American child in school, and his teacher.

Many of the foremost textbook companies, the leading producer-distributors of educational classroom films and filmstrips, distinguished reference book companies, important private proprietary and correspondence schools, manufacturers of "hardware" such as motion picture projectors and educational television equipment—all are located within the greater Chicago region to such an extent of educational product diversity and quantity, and of depth of usage in the schools, that this area probably rightly considers itself the "capital" of educational materials production in the United States.

Furthermore, the American Medical Association, American Bar Association, American Dental Association, the National Congress of Parents and Teachers (The National PTA), and other associations with a vital interest in American education make their national headquarters in Chicago.

The Britannica companies, then, are proud to join our distinguished colleagues in these organizations in welcoming your Subcommittee to Chicago!

A large number of able and knowledgeable witnesses have already testified before this Subcommittee in support of the proposed National Institute of Education. This is my intention as well.

I hope to keep my statement brief—but also to raise a few points that may have been insufficiently stressed in earlier testimony, or that may be new matters for consideration. There are some important respects in which we disagree with other witnesses and spokesmen for this legislation, despite our basic agreement with its purpose.

1. ENTHUSIASTIC ENDORSEMENT OF THE IDEA OF THE NATIONAL INSTITUTE OF EDUCATION

Rarely has a proposed new federal agency received such unanimous, wholehearted, and bipartisan support as the proposed National Institute of Education.

From the first proposal for this Institute by the President in early 1970—formalizing an idea which had long been gaining support among a broad consensus of educators and social commentators—approval has come from all concerned with education, and from all regions of the nation. It is easy to see why.

The vast public expenditures for education by federal, state, and local Governments—the unease among many of our minority groups about the education their children are actually receiving—a new, highly articulate and perceptive group of critics of the shortcomings of American education—all add weight to the need for an appropriate mechanism to serve as "a focus for educational research and experimentation in the United States," as the President has proposed.

We do not join those who insinuate such an Institute has been proposed as a means to diminish federal activity in those programs that have proven of such value to American education in recent years.

Such a disingenuous view should not be consonant with the principles of the many members of the Congress, from both parties, who are supporting this legislation.

We do not believe it is the intention of the Administration or the Congress to use the National Institute of Education as a device to reduce federal support for vital educational programs. We know neither the Administration nor the Congress would wish to throw the passengers overboard, while the scientists and designers seek improvements in the functioning of their vessel.

There is no doubt that an adequate focus for educational experimentation, research, development, and information dissemination is long overdue. In many areas—especially as applied to those projects funded by the Federal Government—substantial savings, as well as improved educational effectiveness, may and should result.

For example, one question that has been of particular interest to my companies is concerned with the relationship between motion picture films and learning.

Some experiments tend to suggest little relationship—and others strongly support our belief in the validity of motion pictures for education.

This should not be a question of merely academic interest to the Federal Government, since tens of millions of dollars of federal funds have been spent to support the production of educational films.

How should such a question be approached? Have some film programs been poorly conceived and executed? When these have been tested, have the experimental design and achievement tests used been valid?

Despite much dedicated labor by psychologists and educators, our knowledge of testing is very rudimentary. This is a point—the validity of educational testing—to which I will return in a moment.

The uncertainty surrounding this simple question of educational methodology is but one example of the many important issues with which the proposed National Institute of Education is to deal. If it is successful, we can certainly anticipate substantial progress towards educational improvement—and not incidentally, the saving of millions of federal dollars that, we are now told, may be misspent in research and development without proper direction.

A susbtantial part of the current research, development, and evaluation of educational materials is, at present, conducted by private, commercial companies, such as ours—another point to which I will later refer. Let me give you one example, a study called Project Discovery.

Here the Encyclopedia Britannica Educational Corporation provided a rich abundance of audi-visual materials, especially films and filmstrips, and the Bell & Howell Company provided appropriate equipment for their use, to schools in California, Ohio, Texas, and Washington, D.C. Here, more than 230 teachers and 5,100 elementary pupils participated.

With Britannica audio-visual materials, more than 75 percent of the teachers reported being able to teach several complex ideas with more success than before, and more than 60 percent reported being able to teach subjects they could not teach before, because formerly they did not have the materials to do the job.

In fact, more than half the teachers admitted that they themselves had gained knowledge of their subjects from these films and filmstrips!

We are pleased by these results, but they are only a tiny step in the need for more knowledge about educational practices.

How *should* film or other learning materials be created and used for education?

What is the proper role of book media?

Of television?

How can these be improved?

The questions are endless and fascinating. But they are not merely academic. With the current strains on our educational system—and the budgets for them—the validity of the proposed National Institute of Education becomes increasingly evident.

2. PROPOSAL FOR A "PRESIDENT'S COUNCIL OF EDUCATIONAL ADVISORS"

The National Institute of Education is proposed as an agency of the Department of Health, Education, and Welfare—and quite rightly so.

However, as an indication of the importance to our nation of the future of our educational systems, I would like to suggest that consideration be given to augmentation of the President's staff by the creation of a "President's Council of Educational Advisors."

Just as the office of the President is now strengthened by the inclusion within it of the Office of Science and Technology, and by the Council of Economic Advisors, may it not be also strengthened in the area of education by such an educational council?

In fact, just as witnesses have testified that the proposed National Institute of Education is "shamelessly" modeled after the National Institutes of Health, let me suggest that a new "President's Council of Educational Advisors" be modeled after the existing council of economists.

This suggestion was first advanced in the late fifties by a committee, which I (that's Senator Benton) had the honor to chair, whose members were Senator Harris (then head of the Department of Economics at Harvard), Philip Coombs (then Chairman of the Research Division of the Ford Foundation), Beardsley Ruml, and Walter Heller.

We took as our model the Council of Economic Advisors (which was established by the Full Employment Act of 1946), and recommended that such a

Council of Educational Advisors issue an annual report on the state of education and its progress during the previous year.

And that this report be submitted to a joint committee of the Congress, to be established along the lines of the Joint Committee on the Economic Report.

This structure appealed to us—the committee whose membership I listed above—more than ten years ago, and it appeals to me still.

It would provide the proper Presidential support, and the proper Congressional review, of the workings of the proposed National Institute of Education.

I strongly recommend further consideration of this proposal by your Subcommittee, and by the Congress and the Administration.

3. REAFFIRMATION OF FAITH IN THE AMERICAN EDUCATIONAL SYSTEM

The past five years have seen a rising chorus of complaint about the American educational system. The critics are numerous, well-intentioned, articulate, and zealous. Much of their work has been of the greatest value in stimulating our adult population, so many years removed from the classroom, to look at our school practices with fresh eyes. And the results are clear: a fresh approach to educational practice is evident, and new methods such as the "open classroom," even the open school, programmed learning, new systems of teaching reading, new multi-media instructional systems, Sesame Street, and many other forward steps are being taken.

Perhaps the critics have, in totality, been overzealous. The broad educational picture in the United States, seen from proper perspective, is not as dismal as one would gather from the recent popular literature on this subject.

The fact remains that of all the major nations of the world, our educational system provides more learning to a greater proportion of its citizens than any other. Despite the deficiencies of our schools and colleges—and these we must seek to overcome—our system is the best and most broadly based in the world.

We are all distressed, for example, by the violence in our schools and colleges. And many consider this an "educational" problem.

Yet the critics who bring this to our attention—and speak of favorable learning situations in other nations—find it convenient to ignore the fact that we have seen similar violence among young people in many other nations in recent years—nations with such diverse educational, political, and economic systems as Japan, Egypt, Mexico, France, China, Germany, and other countries.

This phenomenon of violence and lawlessness among the young cannot, therefore, be attributed to specific features of the American educational system.

We also hear much about the conservation among the schools, and their resistance to innovation. It is true we have a large and somewhat inflexible school system. It does take years or decades to achieve educational change. Yet those who urge rapidity or change might do well to pause and reflect upon the many new educational proposals advanced during the past decades—many now obvious, in hindsight, as patently absurd. Would they have wished these to have been rapidly instituted in the schools?

The balance between preservation of the traditional and valuable, and acceptance of the new and promising, is not all one-sided. Everything old is not bad, and everything new is not good.

Most of our judgment on these matters must depend on the collective experience and knowledge of those on the firing line, the teachers and administrators in our schools. There are millions of these working professionals in the schools now, and tens of millions have served in the past recent decades. A high proportion are dedicated professional men and women whose stature and importance have never been recognized fully in American society. Most of them are not working in education for money or self-aggrandizement, but because they love education. Many work long hours, often under trying conditions, in one of our noblest professions.

How shall we value their collective experience and judgement?

Is it not true that these teachers and administrators have, in fact, provided the major actual "evaluation laboratory" for educational practice?

In our time of rapid communication, can it be maintained that they will be unwilling to adopt efficient and sensible innovation? I do not think so.

Two telling points in this connection were made earlier in testimony before this Subcommittee by Dr. Gideonse that do bear repeating.

First, he noted that educational research—as distinguished from research in the physical, natural, or biological sciences—is inseparably connected to questions of human choice and value. For progress here, then, we must depend

on the collective values and good sense and judgment of the practitioners of education, the teachers and administrators in the schools.

Second, Dr. Gideonse noted the dangers of the concept of a "delivery system" in which separated experimenters or academic experts, removed from the schools, would research and develop new methods of instruction that would then be "handed down" to the practitioners in a one-way flow. This system will not be successful.

Certainly educators "will tend to resist the low status implications of being on the receiving end of the system; academics and scientists in turn will tend to find confirmed their latent suspicions concerning the professional motives and competencies of the 'natives they have come to save'."

I think Dr. Gideonse's testimony bears careful study as the Institute is formed. An important place—an equal place to all other disciplines—must be afforded the working teachers and administrators within the Institute. Otherwise it is unlikely to become more than another remote, uninfluential center for behavioral and social psychologists. In a sense, the teachers and administrators in our schools must be a central, decision-making part of the Institute.

4. IMPORTANT ROLE OF THE EDUCATIONAL MATERIALS PRODUCING INDUSTRY

Many witnesses before this Subcommittee, and other commentators on education, have referred to research and development in other fields—space, transportation, the health fields, and so on.

We have all heard a good many times of the disparity between the relative research funds spent in these fields, and in education. And from these data, comparisons are drawn about progress and achievement, comparisons that are disparaging to education, but made with the best of motives: namely, to improve the funding of educational research.

Yet few of these commentators have taken the two necessary additional steps in this analogy. First, it must never be forgotten that progress in transportation, space, the health fields, and every other example that can be cited favorably, has not been achieved without the vital participation of private industry.

Whether it is construction of new aircraft, space vehicle components, research on drugs by the pharmaceutical companies, fertilizers and pesticides in agriculture, or whatever—a substantial part of the progress of recent decades in these so-called "more successful" fields has been due to private enterprise companies, often working together with Government agencies, universities and research laboratories.

In American education, the significant private companies are the producers of educational materials—textbooks and reference books, motion pictures and other audio-visual devices, and so on.

This is one further step in the analogy that, I believe, must be made if the Institute is to succeed. For the very same reasons that it is not, in general, feasible or appropriate for Government agencies to build airplanes, I believe it would not be appropriate or feasible for the Institute to function without close and harmonious relations with the private companies that today provide educational materials to the schools.

There are opportunities for flexibility, freedom, and achievement that are available in our society only to private companies. Such has been the successful pattern in these other oft-cited fields. So should it be also for the Institute.

I note that the proposed legislation, H.R. 33, does in fact contain this provision in Section 4, that "The Secretary, through the Institute, shall conduct educational research . . . assist and foster such research, collection, dissemination, or training through grants, or technical assistance to, or jointly financed cooperative arrangements with, public or private organizations, institutions, agencies, or individuals . . ." (emphasis added).

I stress this point because—this is the second step in the extended analogy—it is a simple, indisputable fact that the bulk of current educational development is actually a matter undertaken today by private industry.

The educational materials you and I used in school, and those by our children today, come from private companies. These are not inferior materials, in general. They are produced by professional people, subject to keen competition in school adoption and purchase, and refined through many years of actual use in the schools.

I reject utterly the notion that most of our textbooks, films, and other educational materials are of poor quality. The process by which they are made and

selected is, I believe, more valid than the testing procedures now available in the current "state of the art" in educational psychology.

Thousands of workers in the textbook and reference book publishing houses, audio-visual companies, and other educational materials producing organizations, including specialists from all fields, work very hard to produce the best possible materials. Then, millions of teachers and school administrators select among the broad range of offerings. In most cases poor materials are soon rejected.

The testing procedures that some wish to apply are themselves, in fact, produced by the same procedures as the educational materials. It is an error in logic to assume that the tests are somehow superior to the materials.

Thus, we cannot agree with the much-publicized reasoning of Dr. Komoski, and its implications that our students are receiving inferior educational materials. It may be true that they are receiving "poorly tested" materials—but this is because the tests are poor, not the materials!

Mostly, such tests presuppose the fixing of carefully defined "behavioral" or other objectives, sometimes called "learning outcomes."

In many cases, these must be drawn too narrowly for acceptance by most educators. Certainly we can specify if we wish that a geography student should be able to list the names of the major rivers in America.

But is such a major goal of instruction?

Do we not wish to teach our students a love of learning, and teach them also the ability to learn by themselves?

In particular, this last and most important goal of education, that the pupil learn to learn by himself, is generally overlooked by the proponents of tightly drawn behavioral learning tests.

Let me return to the role of the publisher in development and innovation, both of materials and tests. This becomes apparent only after some reflection. Materials produced by university and research center groups have not, in general, been shown to be superior in the classroom. If so, our industry would have disappeared some years ago. The reason why it has not is that we often apply the similar procedures, care, research (when it is valid), and use the same type of specialists in all fields, as the non-profit organizations!

Let me give some examples taken from the experience of our companies. In the early 1960's, when the principles of programmed learning were exciting wide interest, at Britannica we began a major effort in this field.

At first we thought the materials would be used in teaching machines, and the program was called TEMAC, an acronym for "Teaching Machine." The first quick experiments showed that the machines did not work well, so we abandoned them, and produced the materials in book form.

The Encyclopedia Britannica Press released almost a whole high school mathematics curriculum in this form—and this was the first major programmed learning effort to be published. Its existence and success then spurred similar programmed learning work in other fields, and by other companies.

At about the same time, we began to produce the first Visual Audio Lingual foreign languages courses—that included film, audiotapes, and traditional and programmed textbooks.

We found effective ways to teach Spanish and French to the American pupil with these newer media. Within a short time, as is natural and desirable, other publishers began adding these new media to their foreign language courses! And then we went back to refine our materials further. And we went on to do a similar Latin course. This is the process that leads to excellence in educational materials, as in other activities in our society.

In the mid-1960's, we found a distinguished educator, Dr. R. Van Allen, with a new method for teaching reading, called the "language experience" approach.

Here, the pre-reading child's own spoken language is used as the vehicle to start him reading.

Language Experiences in Reading began to be published about 1966. Attention turned to the disadvantaged child from the ghetto—a child often apathetic, sluggish, hostile, difficult to reach in school.

We produced a series of remarkable films without narration, called Magic Moments, to excite this apathetic or wary and suspicious child to communicate—the start of the reading process in this "language experience" method.

This year, for the first time, a special pre-convention institute on the language experience method was held at the International Reading Association Convention, and now we notice other publishers using this phrase, and aspects of the method, in their approach to reading education.

We are proud of these new programs, for these are the ones that have succeeded.

We are proud of the risks we took. Of course, not all of our materials have been so successful—but we learned quickly of those which were inefficient and ineffective in education. Of course, we learned. Our own testing in the field, done with teachers and former teachers, told us.

Such is progress in commercial educational materials production. Profits are desired. Innovations are attempted. Failure is rejected, and success is pursued, copied, and eventually improved.

This is the process that has worked best in all other aspects of our society. It is the process that the proposed National Institute of Education should seek to include in its functioning. Unless it does, and includes therein similar working collaboration with private industry as is encountered in the aerospace, health, and other fields, this Institute will never achieve its potential effectiveness.

5. TELEVISION AND LEARNING

In his testimony before this Subcommittee in February of this year, Professor Moynihan noted that the President had proposed that the National Institute of Education concentrate on several topics: new measurements of achievement, compensatory education for the disadvantaged and handicapped, reading education, experimental schools, the learning process and television.

The last is of particular concern to me, because the Encyclopaedia Britannica Educational Corporation is today—and has been, in the past, through the former Encyclopaedia Britannica Films—the foremost producer-distributor of educational classroom motion pictures.

We were the first, through the former ERPI Films on which this company is based, to produce motion pictures in sound for classroom education, and we try to make the best such films today. But we are not alone in this field—and we salute those in other similar companies who prepare such materials.

Coronet, McGraw Hill, Bailey-Film Associates, the Learning Corporation, and many other companies—too many to list here—also produce films of distinction for use in the classroom.

Such, in fact, was the dream of Thomas Alva Edison, George Eastman, and other pioneers in the motion picture industry: to use this medium in education.

Such also was the dream of those in the early stages of television.

Today we have two large, widespread systems to provide education via the moving image and spoken word to the pupil at school: the educational film industry is one and instructional television the other.

It seems a great waste of our resources that these similar movements have not come together. Large amounts of federal and foundation funds are spent to finance television production of materials that are, in intention, similar or identical to those already produced by the educational film companies.

Above all, television—whether broadcast, cable, or closed-circuit—has a mechanism to deliver the educational film to the pupil.

The educational film companies have a vast repository of material that could so be effectively used.

One specific suggestion, then, for the Institute might be an examination of this question. Substantial savings and improved educational effectiveness could be expected to result.

6. SUMMARY

(1) We enthusiastically endorse the idea of the proposed National Institute of Education, and reject the insinuation that this Institute will be a vehicle to reduce federal spending for education.

(2) We suggest the establishment of a "President's Council of Educational Advisors," modeled after the existing Council of Economic Advisors, which would issue annual reports on the state of education and educational progress in the United States to a joint committee of the Congress, to be established as is the Joint Committee on the Economic Report.

(3) We praise the basic validity of the American educational system and the professionalism and talent of its working practitioners, the teachers and administrators. With scholarly leadership based on research, we believe the system is sufficiently flexible to accept change, and has enough resistance to innovation to avoid temporary fads. Since the teachers and administrators themselves are responsible for "evaluation" of education materials, it is recommended that they be accorded a role in the proposed Institute, along with other professionals.

(4) The role of commercial producers of educational materials—textbooks, reference books, motion pictures, filmstrips, et cetera—as the de facto researchers and developers of new educational materials should not be overlooked.

The analogy with the research and development success in the aerospace, health, and other industries to education should be carried through to note that in these other cases, collaboration with private industry has been an essential feature of progress.

We recommend that the Institute be established to conduct similar collaborative work with private commercial educational materials producers, for we believe our American textbooks, reference books, and educational films and filmstrips, are in the main, of high quality.

(5) We suggest that the Institute explore the wasteful duplication presently in effect between the educational television and educational film organizations.

Mr. PARTON. I will excerpt some of Senator Benton's remarks at this time.

First, let me begin by heartily commending the wisdom and thoroughness of the Subcommittee in holding hearings on this subject in Chicago. For this city is truly the center of a major segment of the industry that produces and distributes the educational materials used by the American child in school, and his teacher.

Many of the foremost textbook companies, the leading producer-distributors of educational classroom films and filmstrips, distinguished reference book companies, important private proprietary and correspondence schools, manufacturers of "hardware" such as motion picture projectors and educational television equipment—all are located within the Greater Chicago region to such an extent of educational produce diversity and quantity and of depth of usage in the schools that this area probably rightly considers itself the "capital" of educational materials production in the United States."

At the end of his statement he summarizes, briefly, five major conclusions. I would like to read that summary and depart from the brevity of it in the one instance, to read the whole recommendation.

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That is the end of Senator Benton's testimony. With your permission, sir, I would like to add a few extemporaneous comments of my own, and then would be delighted to respond to questions.

I would first observe it has been fashionable in the recent decade to talk about the knowledge industry and the implication has been that it is comparable to the steel or automobile or other big industries.

Our schools are in a turmoil. Public education is gripped by perhaps the most severe crisis in our history. We are hemmed in by the calamatous financial condition, teacher layoffs, teacher strikes, demands for local control and public outcry for accountability.

What we face today is a crisis of confidence. Increasingly we hear from critics—parents, students, and educators, all declaring that our schools are failing and that the price of our failure is too exorbitant.

Never before has the criticism of public education been so insistent. Critics question whether or not the institutions of public education are working. And they ask, quite properly, why, after millions of dollars have been invested in education, the result is negligible—our children cannot read, they cannot add, and they cannot claim to be prepared for the world of work.

The reason that our successes in the past have been limited is that we, as educators, have never done the basic research in education which must be done. It should be a matter simply of deciding on a goal and setting a plan in action to accomplish that goal. However, the nature of learning itself is still such a mystery, that we cannot even say for sure how children learn to talk. And no one has yet determined why children learn more out of school than in it.

These are some of the kinds of things that we need to know before we can claim to be fulfilling our mission as educators, as the transmitters of culture.

And yet, all too often, questions remain unasked, or perhaps, unanswered, because the education community as a whole has not addressed itself seriously to the initiation of realistic research and development procedures from within.

I believe it is highly ironic that the field of education—which is staffed by people with the highest degrees, and who have been trained in sophisticated research techniques, seems incapable of directing research on itself. What we need is a change in attitude on all levels of education—the reliance on simple dogmatism is not only unrealistic, but dangerous today in the face of the challenges which beset us.

We need to make research and development of new programs a viable, central part of every educator's career. And we must be prepared to accept the ideas of the young turks, the imaginative, if not seasoned, new teacher.

We know, however, that the change in attitude must be accompanied by a new commitment of more funds to the task of researching new ideas and developing new programs.

Statistics show that the amount of money spent on educational research is far behind research amounts spent by private industry, by the sciences, and by the military.

But it is not that fact alone which is so galling—it is the priorities which in the past have placed industrial, scientific, and military advances over educational growth. It is foolish to consider for even a moment that all the industrial advances are not built on educational progress.

Think what could be done if a generation ago we had had the sense to realize that education is the keystone to all progress, and that without the flexibility to change education, a nation must suffer disorder.

This is an area of vital concern, for as I have mentioned, the failures of our schools cannot be remedied by relying solely on old practices.

If we are to advance at all, and advance we must, to keep up with the demands of parents and of children in this time of social reorganization, we must be prepared to adequately address ourselves to the need to try out new solutions to old problems.

This commitment of funds to research and development is clearly not being met by the States. It is not at all unusual for a State to cut its entire education budget, which is not usually adequate at any rate, leaving the percentage left for research and development at the bare minimum.

I can report to you, I am sorry to say, this is the case in Illinois. It was the case last week when I submitted my budget to the Illinois Senate Appropriations Committee which chopped over $2 million out of my budget almost exclusively from the area of research, planning, and development, the feeling being somehow educational research is some kind of "pie in the sky," it really is not worth the investment of the State's limited funds and financial resources.

I think this is a tragic mistake on the part of the State Senate. I anticipate probably, the same kind of attitude when we submit our budget to the House Appropriations Committee and the General Assembly.

I would submit there too, it would be a tragic mistake. We cannot say really what we are doing is making an investment in the future, really what we are talking about is seed money which will come back a thousandfold in terms of economies to the State; in terms of educational quality for all the children of the State and the Nation.

I strongly approve if for no other reason my particular State of Illinois has not been responsive to the needs of education research or planning and development.

I strongly support the initiative of the Federal Government in providing funds for research and development and leadership. The Federal leadership in this area is vital to the very existence of public education.

I agree in both principle and policy that the Federal Government has the greatest responsibility in the area of fostering educational research and development.

The Federal Government has the ability to see the overall range of problems and issues which confront American education. The National Institute for Education will be able to contribute much to the several States by providing leadership and expertise on problems which demand full-scale investigation.

Such questions as the nature of the learner, the role of the parent, the teacher, or the school, the process of verbalization, the development of reading skills, are questions which are national in scope, and which can probably be resolved given a serious and coordinated effort to research solutions and develop methods.

I would suggest, however, that the current proposed legislation be amended to provide for a greater degree of State discretion.

I propose, instead of one National Institute of Education, the Federal Government support what would amount to 50 institutions of education, one in each State and each a part of the State's own office of public instruction, responsible to the State superintendent.

This "institute" might instead of being a separate entity, be incorporated into the existing research and development office of the State office of public instruction, and where a State does not have such an

office, the Federal grant might provide the basis for its development.

I suggest that a redefined institutes of education be responsible in each State for:

(*a*) coordination of all research programs in the State, including limited control over the program content of all federally financed title programs as well as State-supported programs;

(*b*) development of new programs through contracts with school districts, institutions of higher education, or private industry;

(*c*) evaluation of research programs for effectiveness, efficiency, and transferability;

(*d*) dissemination of information resulting from these research programs to communities across the State and also to the Federal Government.

I am proposing in other words, that the Federal Government instead of consolidating all research activities in the NIE, distribute the potential for research among the States—that the Federal Government provide the funds necessary for the States to do the kind of coordinating and evaluating which is necessary but which up to this time they have not been able to afford; and I am asking the Federal Government to provide an additional sum of money to be used for research independent of title programs and categorical aid.

I further suggest that the NIE be considered a central clearinghouse for the information gathered in the States, to provide that information to each State, but I strongly urge that the functions of the NIE be tested first in existing offices within the Office of Education to see if those offices do not already have the capability to disseminate information.

The Office of Education currently has 14 identifiable departments or divisions all of which have at least one staff designated either planning and evaluation or program planning.

I must ask myself why, if all of those people at the Office of Education, not to mention the National Center for Education Research and Development, and the National Center for Educational Statistics, both also located in the Office of Education, are working on research, planning, development, and dissemination, the process is not working.

I must say, in all candor, that I cannot recommend the establishment of a National Institute of Education when it appears that the functions it would perform are already relegated to the Office of Education.

I expect that if the Office of Education is not doing its job, then the NIE, which would be administered by the same people, although admittedly from a different perspective, would not do its job either.

And if the Office of Education is performing satisfactorily, then I fail to see the need for another organization to do the same things.

I do, however, recognize the need for increased sharing of information on the national and local levels, and I support strongly any efforts which the Office of Education might make in the direction of developing more fully the capabilities of existing media and of ERIC for the dissemination of information on education research.

I submit that the consequences of limiting the focus of the National Institute of Education to one area—most probably Washington—would have far reaching effects on the schools of this country.

At a time when people are demanding accountability and local control it seems dangerous to assume that the consolidation of educational research will meet those demands.

At a time when the President is talking more and more about revenue sharing, it seems inappropriate to centralize the vital work of research.

It seems to me that a much more suitable process of educational research and development will finally come full circle back to the local communities.

Children and adults, of course, both benefit, it is true, from the general research being done on the large scale on the dimensions of learning. But I submit that the children of the cities and towns of America will benefit as much by the increased potential of their local schools to provide innovative and daring programs.

Up to this point, most school districts were hamstrung in their efforts to utilize new ideas, or to develop them, because of the strings attached to Federal and State grants, if they could get the money in the first place.

I suggest that every school district in America should be offered a "mulligan" shot: a chance to do one new thing without fear of the Federal Government or the State government refusing to grant in the future.

I think the atmosphere of education has too long been stifled at the local level, and that the time and the place to change is in the heartland of the Nation.

We need research. It is vital to the dynamics of education. We need to make education productive, and we need to hold educators accountable.

But we cannot develop standards—local, State, or national—without first determining where we are going. How will we get there? How could we do better? We need to decide first to what we are to be held accountable.

We need to define our short and long range goals.

We need to separate the effective techniques from the ineffective ones.

I submit that this research can be done most efficiently and most realistically in the States, and that the institution of State offices of research and development will do much to carry us through the decade of the seventies in educational progress.

Mr. Chairman, I do want to stress again, it is my feelings and the feelings of my entire office that there is a need for a Federal direction and overall coordination and planning in this area and centralization of educational research information.

I believe a clearinghouse kind of operation could be most effective if education is to really—and the State education departments are to really be effective units of educational change and reform in the next decade as I believe they can and must be.

Then I think the State educational agencies must be given the authority, must be given the resources, must be given the incentives to carry out research programs on their own.

Mr. BRADEMAS. Thank you very much Dr. Bakalis for an extremely thoughtful and provocative statement.

Let me make a few observations with respect to your statement and then we will put some questions to you.

I should make, as one of our leaders likes to say, one or two things perfectly clear about the National Institute of Education.

In your statement you remark that the NIE might be limited in its focus to one area, most probably Washington, D.C. That is not at all the intent either of the President, at least as he has enunciated his support to colleges, universities, school systems, and other organizations across the country.

The NIE would contract out most of the research which it would support to colleges, universities, school systems and other organizations.

It is not at all contemplated that this would be some monster enterprise in Washington.

Let me say, with respect to your comments as to the educational research activities presently carried out in the Office of Education, I think there are at least one or two reasons OE is not performing satisfactorily. To use your phrase, one is we are not putting very much money into the Office of Education for educational research.

I believe that I am correct in saying the percentage of all expenditures for education in the United States that is earmarked for research and development is three-tenths of 1 percent.

By way of comparison, and I realize it is a comparison not without complexity, we earmark 10 percent of our total defense expenditures for research and development. In the field of health about 4.6 percent of the budget is spent on research, development, and innovation.

You use in your statement a phrase about the NIE being administered by the Office of Education. I would just like to say as one member of this subcommittee, I have no such commitment in mind and would not be willing to sign any such contract. I say this with no particular lack of respect for the hard working people in the Office of Education.

Mr. BAKALIS. Excuse me, Congressman.

Mr. BRADEMAS. Surely.

Mr. BAKALIS. Would the U.S. Office of Education research effort be dismantled? Duplicated?

Mr. BRADEMAS. No.

As a matter of fact, we had hearings a few weeks ago with the top education research administrators in OE to discuss with them their own perceptions and we were interested in what they think about this, too. We wanted their own views of how they would propose to carry over whatever activities are presently going on in the Office of Education—how they would go about making such transfers and what pieces of that action they thought appropriate to retain within the Office of Education.

But I must point out that we want to bring other kinds of men and women into this whole NIE enterprise beyond professional educators, beyond professional psychologists. We want to bring in the economists. We want to bring in the cyberneticists. We want to bring in the biochemists. We want to bring in the nutritional experts. We want to bring in all kinds of people who might contribute.

I think you spoke very eloquently in your opening statement about our need to learn more about the learning process.

I would now like to ask you a couple of questions.

One question is directed to inducing some response and maybe a little help for you with the State legislature. So, I put my question as a devil's advocate; why is the Illinois State Legislature so backward and neanderthal in understanding the importance of educational research?

Why should Uncle Sam give you more money if those representatives closest to the people, as they like to say, in State government, don't want to do it? Why should we Federal politicians award you the money?

Mr. BAKALIS. With all the proposed revenue sharing which is being discussed now, if one wanted to take the devil's advocate argument—I certainly hope the press recognizes you made that characterization—[laughter].

I do believe from the Federal level one can take an overview of educational needs. It seems to be one of the pressing things we have to consider in this country is, I think, the conflicting kinds of trends on the one hand, the mobility of the society, the increasing homogeneous of Americans as a people would dictate our educational systems; take on characteristics which are similar throughout the country.

So, there is a need for some kind of overview and push centrally by the Federal Government.

At the same time there is a need for us to recognize the public's dissatisfaction with education has resulted, rightly or wrongly in their cry for localism, local control, community control. It seems to me those are conflicting, contradictory kinds of trends, but they do exist in the country.

We need to solve our problems by taking an overview on the other hand, looking at the kinds of things the States might do individually.

I believe it is essential that State education agencies become strong, vital leadership kinds of agencies of government. The time when they were regulatory, supervisory kind of agencies is, I believe, long gone. They must take a leadership role. The leadership role may be slow in coming because of historical kinds of attitudes about where power should reside in regard to education decisionmaking.

I think those attitudes are slower in being changed in the State legislatures than they are in the Congress of the United States. It might be the Congress of the United States might have to provide the stimulus, the prodder to really open the eyes of the general assemblies, not only in my State but throughout the Nation as to what the real needs of education are. How much of a real long-term valuable investment education research is.

I would hope the Federal Government would do the prodding here.

Mr. BRADEMAS. Let me say as one who has been very critical of State departments of education, that I am a strong believer in strengthening them. As a matter of fact, if there were more Mike Bakalises as heads of State education offices across the country, I would be a lot more enthusiastic about giving more money to State departments of education.

What about regional and/or metropolitan approaches? Now, Chicago, Cook County, is a huge city. I have not heard Mayor Daley recommend that Chicago become a State, as Mayor Lindsey is now suggesting for New York City, but would you say that Cook County is so big that it ought to have its own institute of education and be

charged with the responsibility that you suggest for the State department of education? Alternatively, what about the Midwest institute of education to have money and improve cost effectiveness on using a multistate, regional approach?

Dr. BAKALIS. I certainly would not go along without thinking about it carefully with the former, a Cook County institute of education for research, but I think a regional approach for research and planning might very well make some sense as an intermediate kind of step between a total centralism and a total so-called localism with each of the States.

I would certainly be willing to explore and support something that would somehow bring the operation closer to where the action is, so to speak.

I think the direction of the U.S. Office of Education, if I understand it correctly, and of the administration and on the other side of the aisle as well; is toward making sure the kinds of activities and kinds of spending that goes on at the Federal level, at least has increasing output by people at the local level.

I would hope that as you continue these hearings, get the view of people, at least these alternatives would be considered, regionalism or each individual State.

Mr. BRADEMAS. Thank you very much.

Mr. HANSEN. Thank you, Mr. Chairman.

Let me express my appreciation for your coming here to assist in this legislation. I might say that your suggestion as to a really meaningful State role in this whole educational research effort, has a great deal of appeal to me.

I would also agree with the observation the chairman made, this has to assume a willingness on the part of the States to provide the kind of leadership and to develop the priorities and allocations of resources to demonstrate a genuine commitment to this kind of a research effort.

Let me say, a few days ago in a session some of us on the subcommittee had with representatives of the States, the point was made—and I am inclined to agree on the basis of the evidence I have seen and including what I have seen here this morning—that there is a transformation within the States, and within the last few years there has apparently been a very marked improvement in terms of the vigor and effectiveness of the leadership in the various State departments of education. If it is generally a trend, it is a very good sign.

It can be a source of greater confidence on the part of many of us who would like to see the States involved in a real effective program.

Let me turn to one or two questions that were prompted by your testimony. First of all, you mentioned among the purposes the NIE could serve, is that of providing incentives to the States.

How can NIE, how can the Federal program provide the kind of incentives that you think ought to be present in a program, for example, in the State of Illinois?

Dr. BAKALIS. I think simply the existence of an agency which is committed to educational research and planning, in and of itself would be a model and a center for State educational agencies to follow suit.

I think the same kind of technical assistance you mentioned. I would

be the last to disagree that in many State education offices the quality of performance has not been outstanding in the past years.

I am also a firm believer that in many cases, it has been the Federal Government in the past that has really made the most daring, the most innovative, most exciting kinds of pushes in public education.

I think that kind of assistance and technical assistance could be an incentive.

I am not sure I can go along with the idea that because State education agencies may not be of a level you would want them to be, that somehow we need to continue not giving them the opportunity to come to the level they ought to be. It seems to me there is a vicious circle here. We need to hold out a carrot in order to give them direction.

We need to give them the opportunities to be creative and take on tasks. These things are both parts of the same coin, I think.

Mr. HANSEN. We have to be careful to develop the kind of understanding on the part of the States, and of the importance of allocating resources to this effort.

Would you agree we might even create a disincentive if a State legislature places very low on the list of priorities educational research; and the Federal Government comes in with a grant to the State to operate educational research programs in that State, may it not be an incentive for that legislature to pull back and let all the money come from the Federal Government?

Dr. BAKALIS. It certainly might be, but at least the experience that I see in this State is the amount of money that would go into educational research would be minimal anyhow. It might not be a bad thing if the Federal Government filled that void for awhile. It could demonstrate very clearly what the results of that kind of a commitment would be and the States might very well come around to it.

Mr. HANSEN. What would the State of Illinois do, for example, with a grant from the Federal Government in an amount you would consider to be adequate to offer an effective program?

Dr. BAKALIS. I could tell you some of the things we had in mind until last week when the budget was cut—someone said voluntary manslaughter, when I appeared before them.

We were very concerned about having a State experimental school. We think at a time when there are critics of public education, they are very loud and vocal. We need a laboratory where we can find out precisely what are the dimensions of the teaching process. We think that would have been a very exciting kind of project.

I am very concerned personally with what we do as a nation to revitalize our institutions. I do not think we know nearly enough about the dynamics of the institution. How it is put together. How do you change institutions? The school of course, being one institution which everybody is crying let's change and no one really knows how do you get your hands on the levers of how it would effect a change in an institution.

John Gardner talked about institutional self-renewal. It seems to me it is the central problem we face.

How do you convince a legislature you need x amount of money for institutional renewal, when it is very vague really in terms of what you are going to do. This might go down the drain, but on the other hand, it might not.

It is this kind of money we are interested in looking at.

We are in the midst now of going through a new State constitution. Illinois will finally have a State board of education, and yet, no one in the State knows precisely what that board is all about. Who is going to be on it. What it is supposed to do. What its functions are. How it is going to relate to local boards. No one has any idea what the scope of the mission of that is.

We feel that we should have the opportunity to do some kinds of planning and development in terms of how we will move as a State board of education. What will we do with this new and whole mechanism we have for our Government.

I think we need experimental models on school government in this State. It might very well be local school boards as we have known them historically in this country are really inadequate to take over the school governments in the future.

We could certainly use the money for basic kinds of research and on how children read, and learning powers. Why is it in one kind of environment with one kind of person something happens which we call learning, in another kind of environment another person that kind of a thing does not go on.

Those are fundamental questions I think we need to address ourselves to.

Mr. HANSEN. I would agree these are the kinds of research efforts which certainly ought to be given high priority.

My next question relates to your use of the term "clearinghouse" as one of the functions a Federal NIE could serve. Maybe we are talking about the same thing, but it would seem to me even in carrying out research on some of the broad problems you are talking about, there may be a number of States which would like to do the same kind of work. Wouldn't it be necessary for NIE to really exercise the kind of authority which would assign or at least approve a research project in one State rather than in another or several other States, so we are not duplicating and going over the same ground and making the least efficient use of the money available.

Dr. BAKALIS. Mr. Hansen, I would agree with that. I think too many times in all areas of education we have duplicated effort. We haven't really operated on the basis of what other people have done successfully or unsuccessfully. I can see that is a very real function of allocation of certain kinds of projects which the States might do.

It seems to me with all the differences with or between Illinois and Indiana and Kentucky or Wisconsin there is still certain basic kinds of similarity in terms of what the process of learning is that go on and also the needs of certain kinds of communities which can and should be shared, absolutely.

Mr. HANSEN. Part of the function would be in determining who is going to do what, and then another essential function I assume would be the dissemination.

Dr. BAKALIS. Yes.

Mr. HANSEN. Of the results of the research to be applied at the operating level.

Dr. BAKALIS. Yes.

Mr. HANSEN. Let me say that I appreciate very much your testimony. I think your leadership you bring to this important assignment

in Illinois has greatly strengthened my hand in making my argument for this legislation.

I thank you.

Dr. BAKALIS. Thank you, Mr. Hansen.

Mr. BRADEMAS. Dr. Bakalis, I would echo what Mr. Hansen has said. Your testimony has brought a rather different perspective to our hearings.

I, for one, hope that your State legislature here in Illinois will take another look at the budget you have submitted for educational research so that this great industrial State can be a pioneer among the States in the country, as I think its traditions entitle it to be. This would show us that State governments can give leadership in investing State's tax dollars in the kind of an educational research enterprise we are talking about here with Federal tax dollars.

We are very grateful to you for your having testified here.

Dr. BAKALIS. Thank you.

Mr. BRADEMAS. Mr. Parton, would you mind, sir, resuming your place at the table with Dr. Feldzamen and we will now put some questions to you.

I was particularly interested in the stress you placed upon the involvement of working teachers and administrators in the programs to be supported by the National Institute of Education.

I wonder, therefore, if you could give the subcommittee any comment on the ways in which you at Encyclopaedia Britannica Education Corp. has found it possible, you as a private corporation, to involve teachers and administrators in the research and development of education.

Mr. PARTON. I have a few comments I could make.

We have a number of consultants one of whom, Mr. Willis, was a superintendent of schools in Chicago and he is an active consultant to us and forms not only a bridge between our technicians and staff here and the school communities of the Nation, but also has helped us test various pioneering programs out in the field, most notably the one on reading.

He is in Florida where there are large migrant populations who have special problems of reading education, similar to those that would be in say, Idaho. That is one example.

Another example is right here in Chicago. We have the Britannica Reading Achievement Center in which we have spent nearly $\$1/2$ million this past year trying to develop a remedial reading program for children between 7 and 12 with all sorts of new techniques: ear phones and a mixture of audiovisual devices and materials, as well as standard workbooks.

We have had a number of consultants who have gone around the country picking the brains of all the alleged authorities we could find on reading and trying to find out how best to meet this particular problem.

We also found that when they do come up with a program that is innovative, we then have to teach the teachers.

You cannot really program genius. You cannot design a Maria Montessori in the abstract. I am not sure we have done so. Some of our efforts have been failures, even with the best of consultation.

Al, would you like to add to that?

Dr. FELDZAMEN. Let me just add that most of our people—writers, planners, producers and marketing people—come from the ranks of those who have taught and administered in the schools and have therefore gained first-hand experience and knowledge. Some of them return periodically to school as students, or go back to teach themselves in school.

In that sense there is a connection between our company—and I am sure most of the companies engaged in the production of educational materials and textbooks and reference books, films, filmstrips and people who work on educational television as well—a close and continuing association between the private industry centers and the schools themselves today.

Mr. BRADEMAS. One of the criticisms we have heard in the subcommittee from other witnesses is that it is terribly difficult for the consumers of the products of textbook manufacturers and audiovisual materials manufacturers to measure the educational effectiveness of the products.

What do you have to say on this point? You are familiar with the criticism, I take it.

In other words, how can the schoolteachers, school principals, and school superintendents and parents and others know that they are not being bilked by fast talking textbook salesmen?

Mr. PARTON. Well, even the best textbook can be ineffective if it is used by a bad teacher. Sometimes a great teacher can make do with practically nothing.

I recently visited P.S. 33 in New York which is experimenting with the open classroom in the British fashion. It was an utterly fascinating experience where the materials are so diverse you would need a telephone book to list them all.

I do not think the creators of the textbooks are the ones who should measure their effectiveness. They have an ax to grind.

Salesmen naturally want to sell; a publisher naturally wants to see his book or film win a market and win applause and also teach, educate.

This I might think should be an appropriate function for the NIE to apply the calipers to accomplishment.

Mr. BRADEMAS. I agree with that observation very much. It is a very complicated area. But it seems to me, and this may be an expression of an idealistic and naive judgment, that in the long run it is better business for private industry to produce materials and processes that can be—insofar as you can measure these matters—objectively shown to be effective in teaching people.

I take it that you have no disagreement with that judgment.

Mr. PARTON. No, I do not disagree, but I am not sure it is scientifically measurable so precisely.

Mr. BRADEMAS. Well, I think I entered a qualifier when I made that observation.

Where Senator Benton suggested in his statement that the Institute explore the wasteful duplication between the educational television and educational film organizations, what does that sentence mean?

Mr. PARTON. I think it would be better for Dr. Feldzamen to respond to that.

Dr. FELDZAMEN. Thank you.

We have a large, and I think in the main, successful industry in the educational materials producing area providing motion pictures, film strips, slides, and other so-called audiovisual materials for the schools today.

These materials are produced for the most part by companies such as ours and others—in this city, Coronet—McGraw Hill, Learning Corp. of America, and others covering a wide variety of scholastic topics and for people of all ages.

I think that due to the national evaluation process which has been conducted through the years by the millions of teachers and administrators, the good materials are accepted and used, and the poor ones are in the main, rejected.

At the same time there is a system largely publicly supported, either by Federal or State funds, and to some extent by foundations, of instructional or educational television organizations. Most of the material they put on the air they make themselves, rather than attempt to collaborate with the private producers in instructional films.

Very often the same types of topics are produced by both organizations. And in the case of television duplicated and reproduced by many stations and organizations.

Further, instructional and educational television has a delivery mechanism to the pupil, capable of giving the best kind of an education the country can produce using motion pictures. But it does not use the motion pictures—or hardly at all—produced by the private industry that produces and sells them through another system to the school.

Why make several television programs with Federal or State funds when the same topic is already available in material that can be readily used?

I think this is merely a failure of organization and administration throughout the country rather than any conscious attempt of ignorance of the other person's product.

A small change in organization could probably rectify this situation and combine the resources of these two groups.

Mr. BRADEMAS. I just have a final question and maybe you can give me a brief comment on it.

What do you perceive as the impact of two developments on education, video—cassettes and microfiche?

Mr. PARTON. I think I had better explain what ultramicrofiche is. It is a method of reproducing a book on a film so small it becomes the size of your little fingernail. So, a thousand pages could be put on a card the size of a library index card. A library the size of this big room could be compressed to the size of a small trunk.

This is at a time when every university is crammed and unable to find book space, book shelf space, for many books. This new technology offers all sorts of economies.

I was in California at Mills College at a trustee meeting one morning and one of the fellow trustees, the dean of Stanford, said that the Stanford library no longer has a single inch of shelf space. It will take them 3 years to raise the money to build more room and the books come in at the rate of $50,000 a year. Where are we going to put them?

Well, microfiche has this marvelous capacity of compression. It is an inexpensive process. But it is easy to use.

I think it is an enormous technological advance.

Mr. BRADEMAS. I should like to ask Mr. Parton if you are able to send us a memorandum or some further statement explaining the implications of microfiche for education both in this country and abroad. I think the subcommittee would find that most valuable.

Mr. PARTON. We would be delighted.

Mr. BRADEMAS. Thank you.

(The material referred to follows:)

STATEMENT SUBMITTED BY LIBRARY RESOURCES, INC., A SUBSIDIARY OF ENCYCLOPAEDIA BRITANNICA, INC., CONCERNING THE LIBRARY OF AMERICAN CIVILIZATION, A MICROBOOK SERIES

For over 200 years, Encyclopaedia Britannica has been involved in service to education. Most recently, Britannica has formed Library Resources Inc., a subsidiary company that will publish a major series of library collections in Microbook form. After concentrated study of educational requirements and technological possibilities, Britannica concluded that one critical factor in the learning function is an adequate library facility—one that provides, through its resources, the broadest and most objective record possible of our cultural heritage, and the most efficient and accurate means of access to that record. The library cannot be small nor can its materials any longer be stored in a way that permits only the professional scholar to find and use them. More campuses than ever before require even freshmen and sophomores to consult original sources after reading textbook accounts, and to pursue their own investigations.

Today, the rate of scholarly publication is so rapid that few libraries can afford to keep up with *new* books and, at the same time, systematically augment their collections of *older* books and periodicals. Library requirements may represent to a newly formed institution the most difficult obstacle to achieving accreditation.

In short, adequate library facilities at the college and university level have become such a problem that, in many instances, only a major change in library technology can hope to solve it.

This change is exemplified by the Microbook Library Series which permits the collections of the world's most distinguished libraries to be photographically reproduced in miniature form with great precision. The first series from Library Resources, Inc. is *The Library of American Civilization, Beginnings to 1914*. Composed of 6,000,000 pages, approximately 20,000 volumes, and over 12,000 titles, the library ranges over all aspects of America's culture, treating every field and reflecting every important point of view. Subsequent libraries will cover other cultures and fields of study with equal thoroughness.

This series makes it possible for every college in the country to have the library resources of a great University at a fraction of the usual cost. The program can provide every student and faculty member with his own portable reader. And it is expected that eventually it will be possible for users to acquire Microbooks for a small fee so they can form personal libraries for permanent value. The high quality of Microbooks provides for the first time the opportunity for extended reading of Microforms with comfort and ease. Microbook technology is neither an extension of the low-reduction procedure developed chiefly for government reports, nor a modification of the ultra-high-density technique designed for mass storage of technical information. Such systems were not designed for extended book reading.

What is a Microbook?

A Microbook is a photographic reproduction of materials at very great reduction on a small transparent film card. The film card is called a microfiche, a form of document storage and retrieval now in wide use in government and in commerce and industry. Microfiches (an extension of the microfilm concept) generally contain 60 to 100 page images per card; however, the Microbook card contains up to 1,000 page images in the same space, at reductions up to 90x.

The choice of fiche format and reduction ratio for the Microbook libraries was determined in part by a decision to limit each fiche to one title, save for pamphlets and other very brief items. This, along with economic and technical considerations, dictated a fiche size of 3 x 5 inches and a format that allows for

a maximum of 1.000 pages arranged in 50 columns and 20 rows. It is expected that these specifications will become standard for book production in microform.

How a Microbook is Produced

A Microbook is produced by a four-step process. Material is first reduced to standard microfilm size on special film. The microfilm is then reduced once again, and images are arranged in rows and columns on a glass plate. From this glass master, the final dissemination copies are printed by contact photography. Final prints are laminated on both sides with a thick layer of tough, protective plastic. This lamination gives Microbook several advantages over standard microfiche or microfilm; it protects the image from scratches, fingerprints, and dust; it makes the fiche sufficiently rigid so that no additional mounting is required; it renders the fiche almost impervious to deterioration and wear.

Advantages of Microbook

1. The acquisition cost of a library in Microbook, including the necessary high-quality readers, is a fraction of the cost of the same collection in book form, often as much as 15 to 1, including accession costs. The total cost of the *Library of American Civilization* is $19,500, less than $1 per volume.

2. The space requirement for Microbook materials is far less than for book storage. (The ratio is approximately 1 to 250.)

3. Centralized selection and pre-cataloging and indexing make possible higher than normal library standards at much less than the usual cost.

Readers and Reading

With the use of a Microbook reader, the image is projected from inside the reader onto its viewing screen at normal (or, as is often the case, at larger than normal) page size. The reading room need not be darkened. The user is easily able to find and read any page by moving the fiche until the page number is located, or he can simply browse through the pages. He can also move back and forth through the book—from the text to the index, from the index back to the text. and so forth.

A table reader is available with an 8½" x 12" screen. A lap reader is available with a 7" x 10" screen. This reader weighs less than 5 lbs. and will be comfortable and convenient to hold in the lap and read like a book. Both these readers are capable of displaying on the screen the extraordinary quality of the Microbook fiches. These two readers will be followed by a reader-printer to enable library users to make hard copy printouts of any page in a Microbook.

Library Content and Organization

The Library of American Civilization, the first in the Microbook Library Series, contains 6,000,000 pages and approximately 20,000 volumes. It is made up of carefully selected materials on all aspects of American life and literature, covering every period up to the outbreak of World War I. It includes the important points of view reflected in American writing—from those of the framers of the Constitution to those of Indians, Negroes, and other groups that have played such an important part in the shaping of American society.

American civilization is a singularly appropriate subject for the first Library. All colleges in this country, and a growing number abroad, recognize the importance of teaching American history, social and political organization, and literature. Although abundant source material for the study of the United States exists, much of it is rare, and no one has ever assembled. organized, and made available a comprehensive collection for college use. Furthermore, the current upheavals in American society clearly indicate the need to restudy the past, reassessing the work of well known authors, and seeking new perspectives from lesser known authors who may represent unpopular but vitally important views.

The Library will be extremely useful in courses on the history of the United States. It is designed to bring out every aspect of this history—political, economic, social, cultural, scientific, and technological. The Library will also find heavy use in departments of English and American literature. In other subject areas, the Library will help to maintain links with the past: in government, economics. and law, by showing origins and development of our modern system: in drama. dance, music, and other arts, by reminding the student of older themes and treatments.

For future teachers the Library can provide a strong foundation in American studies and the history of the development of American education.

Duplication between the Library of American Civilization and current holdings of colleges and universities will not, in most cases, be appreciable. Studies show that in the case of a general collection of 100,000 or so volumes, duplica-

tion is not likely to exceed 15%. Less than half the titles in the *Library of American Civilization* are currently held by some very large American university libraries that have recently been searched. In addition, some of its titles are rare books, existing in single copies on college or university library shelves, and completely unavailable to most libraries. Inexpensive duplicate copies of fiches allow more than one student to work simultaneously with scarce materials.

Books Selection Procedures

Library Resources Inc. has secured the cooperation of a large number of distinguished college and university faculty members—selected for their preeminence in American studies—to participate in the process of defining the Library, nominating and selecting the titles, and designing the bibliographic aids. The work of these scholars and the cooperation of the institutions that make their books available for copying has resulted in an educational Library of the highest attainable standards.

Drawing on the editorial resources of Encyclopaedia Britannica, the editor-in-chief and a staff of subject specialists coordinated the entire selection process. An advisory board of eminent scholars in American studies has been responsible for the intellectual framework of the Library.

Using the best existing bibliographies in the field as a starting point, and employing the latest technology to manage the enormous quantities of information involved, the editorial staff and its advisors have been guided by carefully planned criteria in making their ultimate selections. Criteria include:

the intrinsic excellence of the title—its historical significance, originality, and style;

the work's representativeness of American thought (the aim is to provide a full picture of American intellectual history; works of foreign authors are included to lend diversity and avoid bias);

the education value of the work—its potential contribution to the student's understanding of the subject and period. The needs of students at every college level, and those of faculty members, have been considered.

The first step in the selection process was to nominate for inclusion many more than the number of works the Library now finally contains. All titles were collated and arranged into subject or period groups. Each such list was submitted to selection committee members, who evaluated the nominated titles. Final composition of the collection was determined by the editors, supported by the advisory board.

Retrieval and Use Materials

One of the most impressive aspects of the program is the wide array of information retrieval tools that accompanies the *Library of American Civilization*. These tools include catalogs in various forms, and hundreds of topical bibliographies and research guides, which are called simply "Biblioguides."

Catalogs

All catalogs are based on the Library of Congress card system. The Library Resources staff has used the cards furnished by the Library of Congress whenever possible. For titles not cataloged by the Library of Congress, entries were constructed by experienced catalogers with the book in hand. These catalog entries often give more up to date information about the content of the title than is found on a Library of Congress (LC) card.

Biblioguides

The topical bibliographies (Biblioguides) furnished with the Libraries are an innovation of great usefulness, both for research and for reading. In the case of the *Library of American Civilization*, the 20,000 volumes in the collection are indexed, both as wholes and as parts, under some 500 themes of perennial interest to students of American history. Each of the more than 12,000 titles in the collection are indexed under at least one theme; many are indexed under several themes. For each of these 500 themes, therefore, the purchaser of the Library will possess a typical bibliography of relevant works and parts of works. In effect, each of the topical bibliographies constitutes a different arrangement, or cross section, of the Library as a whole.

Each of the 500 topical bibliographies is prefaced by a headnote discussing the theme, and indicating the range and diversity of materials to be found in the bibliography. These research guides are an important educational device. A student may consult the list of themes in order to find a topic for study in depth, and, turning to the research guide for the theme, and to its bibliography,

get guidance in what to read. He may choose to read a few major works on the theme, or instead may consult specialized works as his interest and knowledge grow. A student in an advanced course can direct his reading to a single facet of his topic, but he can also easily find help in obtaining a broad, as well as a deep, view.

The oportunity afforded by the Library Series to foster the diverse interests and needs of students is one of its greatest advantages. A faculty member well-versed in a general subject, whatever his specialty within it may be, can readily work with a student on the topic that interests the student, using the research guides as basic reading lists. The librarian can also work with these guides when asked by students, as he often is, to assist in preparing reading lists.

Future Microbook Libraries

Now in planning and production are more than a dozen Microbook Libraries, as follows:

- Library of European Civilization, in three parts:
  - Library of Medieval Civilization, to 1400
  - Library of Renaissance and Reformation Studies, 1400–1750
  - Library of Modern European History, 1750–1914
- Library of English Literature
- Library of French Literature
- Library of German Literature
- Library of African Studies
- Library of Oriental Studies
- Library of International Affairs
- Library of Classical Civilization
- Library of the History of Science and Technology
- Library of the History of Art
- Library of the History of Philosophy
- Library of the History of Religion
- Library of the History of Political, Social, and Economic Thought
- Library of Italian Literature
- Library of Spanish and Portuguese Literature
- Library of Slavic History and Literature

In Summary

The principal goals of The Library Resource's Microbook Series are:

The Medium—to establish Microform as a standard library medium by publishing libraries in this form of such scope and quality as to ensure wide acceptance;

Bibliographic Support—to achieve the economies inherent in the medium library;

Low Acquisition Cost—to achieve the economies inherent in the medium and in centralized selection, cataloging, and indexing;

Complete System Integrity—to make available low cost, high-quality Microforms, Readers, Reader-Printers designed to meet approved library standards.

These goals make it possible for colleges to acquire extensive Library Resources at a fraction of the normal cost, and to reduce operating expenses markedly. Eventually, it is expected that Microform can make it possible to operate a library on a *distributing* basis as well as on a *circulating* basis.

Dr. FELDZAMEN. When you consider the average library book costs over $7, just to acquire and shelve, above its purchase price, this represents a tremendous savings using microfiche.

Do let me add that one of the Britannica companies, Library Resources, Inc., is specializing in this field. Using an ultramicrofiche system which permits 1,000 pages to be reduced to the size of a small card (which can then easily be "read" using an inexpensive device), this year Library Resources, Inc. will be offering a special "Library of American Civilization" to schools and libraries. This collection, in ultramicrofiche form, contains the equivalent of tens of thousands of books and other source documents about American civilization, and will sell for only $20,000 or so. This represents an enormous saving to

the school or library which will purchase this—a saving made possible by this new technology.

In the future, a "Library of Medieval Civilization" will be offered similarly, and other topics are also planned.

Mr. BRADEMAS. Thank you.

Mr. Hansen.

Mr. HANSEN. Thank you, Mr. Chairman.

I also join in extending to Mr. Patton and to Dr. Feldzamen a very warm welcome to this subcommittee.

I hope that you will convey to Senator Benton our sincere appreciation for a very thoughtful and very constructive statement.

Let me ask Mr. Parton as to the role the public institution might play in this whole area of research contemplated by NIE.

I would also observe that the films we saw last night produced by Britannica were of exceptionally high quality.

We were very much excited in seeing what is being done, thereby what can be done by the extension of this kind of a technique.

So, it strikes me that with professionalism and experience and skills in an organization such as Encyclopedia Britannica can bring to this effort there must be an important role that it can play in the total educational research effort.

Do you agree, there is a role and what role do you see specifically an organization such as yours can play and generally for nonpublic institutions?

Mr. PARTON. Well, speaking for Britannica, it is a privately owned company which has had a relationship with the University of Chicago ever since Senator Benton acquired it from Sears Roebuck.

This gives the University of Chicago a tremendous amount of money in the form of royalties.

I am on a university committee which is currently considering about 15 projects. This committee is headed by President Levy of the university and some of its funds come from the Britannica. We are considering how to use them to obtain better means of evaluation, or to set up a center for the collection of educational audio-visual materials. And other kinds of projects, many of which are far-out research.

I am distressed that the private foundations that also do similar things have been under such attack the last couple of years for the malfeasance of a few brigands who didn't play cricket.

The concept of endowment which comes out of capitalism basically, might be said to be in the finest fruit of capitalism.

You do not see it in China. You do not see it in Russia or Communist countries.

We have in our country the Ford Foundation and many other enterprises, such as the Carnegie Corp., that have been doing research. You well know, better than I, they support all kinds of research education.

This brings me back to my feeling that your proposal for the NIE is a functional one.

Mr. HANSEN. Let me raise a question and direct it to Dr. Feldzamen, pursuing the questions raised by the Chairman relating to the problem of duplication. Would you agree that educational television and the educational materials which can be made available through television techniques can be enormously expanded and brought within the economic reach of many of schools who can not now afford them if

somehow we can achieve an adequate degree of standardization and compatibility in the hardware used for the dissemination of the materials? Do you see this as one of the functions that NIE can perform?

Dr. FELDZAMEN. That is a most perceptive question because the one audiovisual medium that covers the world is motion pictures. Motion picture standards are all the same all over the world. Films are projected at 24 frames per second. So, American movies entertain, and educational films are used, everywhere.

Television has quite different standards in Europe than in the United States.

Of most importance here to the future would be the lack of standardization in the forthcoming systems of video cassettes and their players.

The manufacturers are beginning to come together, realizing that perhaps without standardization they will lose the bulk of the early market; namely, the institutional market: the industrial and educational markets. Standardization there is most important.

If an Institute of Education, as here proposed, did recommend for school use a particular type of instrument, to be used for the presentation of all audio-visual images, I have no doubt this would have a major effect on the electronics industry in the United States as well as on educational practices.

Mr. HANSEN. Thank you very much.

Mr. BRADEMAS. Mr. Parton, Dr. Feldzamen, we are most grateful to both you gentlemen for your responses to our questions.

We are very grateful as well, to Senator Benton for his excellent statement.

Mr. PARTON. Thank you.

Dr. FELDZAMEN. It was a great privilege to be here.

Mr. BRADEMAS. Our next witness is Dr. Theodore W. Schultz of the Department of Economics, University of Chicago.

The Chair wishes to extend a particular welcome to Professor Schultz. He has counseled with and assisted the subcommittee for a number of years. And I suppose it is fair to say he is the father of educational economics and the idea of education as an investment in human capital.

We look forward, Dr. Schultz, to hearing from you, sir.

STATEMENT OF DR. THEODORE W. SCHULTZ, DEPARTMENT OF ECONOMICS, UNIVERSITY OF CHICAGO, CHICAGO, ILL.

Dr. SCHULTZ. Chairman. Mr. Hansen. Let me say the obvious, it is a privilege to be here.

Let me then mention two activities that should have top priorities today in education nationally. They are investment in research pertaining to education, and preschool investment in children.

I will not have time this morning to discuss the latter here, except to say that our economic studies show that we are underinvesting in the preschool development of children.

We need a National Institute of Education that will be supported in a continuing manner. It is important to have research that would concentrate on schooling and higher education. Your bills, H.R. 3606 and H.R. 33, on which you are holding these hearings, is in my judgment a fundamental approach in meeting this need.

Your bill is cogent. It is clear. It deals with the basic issues. Much thought and study has gone into it. It takes the long view.

In H.R. 3606, page 2, you have a declaration of policy which says:

> While the direction of the education system remains primarily the responsibility of State and local governments, the Federal Government has a clear responsibility to provide leadership in the conduct and support of scientific inquiry into the educational process.

This is a valid statement. The fruits of research go into the public domain and become public goods. They do not serve one State or one locality because the research results are available to all, as they should be.

If there is going to be basic research it is for society as a whole.

I shall comment first on my own involvement in and concern about organized research. Next I shall argue that the proposed Institute should have a built in set of politically accepted standards to allocate a part of these funds to serve the institutional diversity of our schools and higher education. There is no easy answer, but I shall endeavor to give you one or two leads. Thirdly, I shall suggest that the Institute should specify basic research areas to make sure some important ones are not neglected. The history of research in education is traditionally dominated by psychology and aspect of learning theory. Although they are important they are not the whole story.

First, then, a brief comment on my own roots, particularly with respect to what organized research is all about.

My career started at Iowa State College in 1930.

The Federal Government had just passed the Purnell Act which gave each State $60,000 to conduct research in the social sciences, really for economics at that time. That probably was the best set of funds for research I have ever had access to throughout my whole career. I have had the privilege of receiving foundation funds very generously, but I have never had better funds than the Purnell funds. They were always there and they were ideal.

Then starting in 1943, with the University of Chicago, I began to see what was lacking in agriculture in Latin America, Asia, and elsewhere. Countries in these areas were not able to benefit from the research going on in the world at that time, research largely in the biological sciences, serving agriculture.

In the middle fifties' I turned to the point 4 programs. The United States was spending millions of dollars in the Latin countries to assist in the development of agriculture. A substantial part of this was used to establish agricultural research, and yet, with millions of dollars the results were small compared to what the Rockefeller Foundation achieved in Mexico. There is today very little to show from the large U.S. expenditure in contrast with the impressive results that have come out of the programs started in 1942 in Mexico, and in which the Rockefeller Foundation played a major role.

The Japanese also have been very successful in Japan. I think I have a sense of what is involved in successful approaches to bring organized research to bear on modern problems. I understand the research sources of the "green revolution."

Then in 1958, I began to concentrate on the economics of education.

Let me complete this part of my comment by noting that during the last several years I have been a member of COBRE, Committee on Basic Research in Education set up by two academies, the National

Academy of Education of which I am a member and the National Academy of Sciences.

We had a small fund, which now is terminating. The committee tried to get into new areas, to bring new talent into this research.

The Office of Education is picking it up. Mr. Harry Silberman is doing a very fine job in taking advantage of experience of COBRE.

On my second point, I share the view that was expressed earlier this morning; namely, that the bill as it now stands is not quite complete, even though it has the simplicity of a constitutional amendment.

It is incomplete in the sense that it would lead to any over centralization of educational research.

Let me put it this way, had we started out at the time the U.S. Government began to support organized research in agriculture by establishing a National Research Center, for example, the National Center at Beltsville, Md., we would simply not have had a tenth of the research we have had. We decentralized a large part of this research at the outset.

We gave each State experiment station a continuing budget. It is true that half of them have not produced much. They have been too small and for other reasons, but what has been produced as a whole is extraordinary, and outstanding achievement in the modernization of agriculture.

It would strongly urge you to develop as an integral part of NIE a legislative authorization that would decentralize a substantial part of the research. The required decentralization is not something a national research advisory committee can do. You will have to do it because there are too many political issues involved.

We did find a workable formula in the agricultural area to which I have alluded. You must find a workable formula here, too. You need a formula that would establish a systematic process by which a part of the Federal funds will go in continuing manner to centers and groups of centers.

You have to take account of the diversity in schooling and higher education.

You have to start basically with the enrolled number of students, including higher education over the United States. It is almost like the way we started in agriculture many years ago when such Federal funds were allocated in accordance with the farm population.

You should plan for both public and private centers. I have played around with what I think are the relevant, perhaps politically accepted standards such as enrollment, and the educational geography of the United States.

To repeat, there are strong reasons for both public and private centers in this area, which do not exist in the physical sciences or in agriculture. Your bill should specify the decentralization and not leave it for the Research Advisory Committee to do in some ad hoc fashion. They are not the appropriate political responsible people to undertake this task.

Therefore, it is the responsibility of the legislative process to find a formula by which it is to be done.

I think I have a nice formula here, but I can't defend it. Although, if I were in Congress I would see how far I could go with it. [Laughter.]

And I would lose out, I suspect, because of political pressures and the many parts that have to be recognized in the process. But to keep what I am saying in bounds, let me hold back and simply say that your bill is incomplete with respect to decentralization.

Furthermore, in my judgment, it is also incomplete for it does not specify some basic research areas and research approaches that require special attention.

In COBRE, we had a hard time mobilizing anthropologists. In some sense it was also true of economists. Few economists applied. But we must get economists into educational research.

Thus, my plea is that you modify and complete this legislative authorization for educational research by developing a workable formula that would be acceptable to our body politic which would decentralize some of the funds and get them to the right places for continuing research that will attract talents into educational research.

Thank you.

Mr. BRADEMAS. Thank you very much, Professor Schultz.

It was enormously stimulating and helpful to us.

I might say to the point you made about the importance of decentralizing this enterprise, I think there would be no difference of opinion at all on the part of most of us on the subcommittee with you on that.

The question we wrestle with is what is the appropriate mechanism? You may have heard me say earlier, it was represented by the President—and in any event it seems to me to make sense—that most of the research that would be supported by the NIE would not be conducted in a Washington-based NIE. It would be out in the country.

Dr. SCHULTZ. Yes.

Mr. BRADEMAS. But you are talking about some formula to allocate funds on a State, regional, or metropolitan or some other basis.

Dr. SCHULTZ. You don't build research centers in the States on 5-year contracts. You don't get competent scholars committing their life to it on such short-term arrangements.

Mr. BRADEMAS. I thoroughly agree with what you have said. A continuing issue in these hearings is the relationship of the rather different pair of entities; namely, the NIE and the Office of Education.

There are those in HEW who I know would like to see in effect the NIE be the captive of the Office of Education.

Dr. SCHULTZ. Sure.

Mr. BRADEMAS. I think that would be unfortunate.

Dr. SCHULTZ. Absolutely.

Mr. BRADEMAS. I think we both agree that is essential.

Dr. SCHULTZ. We do.

Mr. BRADEMAS. I have another issue. We have had school bond issues turned down all over the country. Dr. Bakalis, I think, was suggesting the electorate does not perceive they are really getting dividends on their investment in education.

Can you tell us from your viewpoint as someone who has delved in the field of economics of education, what we can in time hope for, if that is a fair question? Maybe it is not.

Dr. SCHULTZ. I cannot give a very precise answer. Let me limit my comment to higher education. This is where I am doing some work and thinking.

I would think the public is quite correct in worrying about the

financing of higher education. In view of the high level of income and wealth of about half the parents (families) who have children in college, the time is overdue to shift to a full cost pricing in our public institutions.

Students in publicly supported institutions pay about 15 percent of the cost of the instruction they get. There is no reason why upward of half these students in the United States should not be paying the full cost.

This step would alter and improve the possibility of helping more needy students.

In the private institutions students pay about 46 percent of the real cost of their educational services. Many of them are also relatively rich. One of the problems is some are too rich, to get down to business.

Now, this is just the sort of an issue which ought to be thought through and seen from many angles. The equity issue that I am raising is very complex.

Mr. BRADEMAS. It seems to me, as we think of our elementary and secondary schools, one of the appropriate items on the agenda of the National Institute of Education would be the question of coming up with some reasonable way to judge the effectiveness of our investment in the schools.

Dr. SCHULTZ. That is right.

Mr. BRADEMAS. Thank you.

Mr. Hansen.

Mr. HANSEN. Thank you, Mr. Chairman.

We are most grateful to you Professor Schultz for some extremely helpful testimony and for identifying what I think are some areas we should really deal with and for providing the kind of legislative history that will assist those charged with the responsibility of implementing this program.

I am particularly pleased, as I know our chairman was with your initial comments on the importance of preschool programs.

Dr. SCHULTZ. Very important.

Mr. HANSEN. I think you probably came into the room after the chairman had made reference to the fact that work in early childhood programs has probably been the most dominant effort undertaken by the subcommittee over the last 2 years.

Dr. SCHULTZ. Yes.

Mr. HANSEN. Now we are just at the point of reporting to the full Committee on Education and Labor the results of these 2 years of effort which hopefully will result in the enactment of some landmark legislation in this area.

We feel, and obviously you agree, that this has a very high priority.

Dr. SCHULTZ. Very high.

Mr. HANSEN. In terms of the whole area of educational research efforts.

You have also made reference to the fact there are other areas you think might be overlooked that ought to be on the agenda of the National Institute of Education.

Dr. SCHULTZ. Yes.

Mr. HANSEN. Could you list some of those you think ought to be given top priority in the design programs and allocations of research and resources.

Dr. SCHULTZ. Perhaps I ought to start a little differently.

At our best educational graduate research university complexes there are schools or departments in education that are doing real research.

In recent years, a strong effort has been made to bring in research talents from various disciplines. This is what led to the COBRE experiment in which there was an attempt to recruit talent, in addition to that from psychology, also from anthropology, economics, sociology, history, and political science.

My own judgment is the sociology is coming along fairly well. Anthropology has not been mobilized, which can, from a cultural point of view, make a major contribution.

Economics can be mobilized.

All this is once again a plea to mobilize new types of talent.

Mr. HANSEN. Let me say, Professor Schultz, your testimony and responsive questions have been among the best we have had the privilege of hearing during the course of the hearings on this legislation.

I would hope we can call upon you.

Dr. SCHULTZ. Any time.

Mr. HANSEN. In the future as we look forward.

Let me finally acknowledge our indebtedness to you and the indebtedness of the entire country to you for your pioneernig efforts in this area of educational and economics.

Mr. SCHULTZ. Thank you.

Mr. HANSEN. Thank you.

Mr. BRADEMAS. Thank you.

You have been very helpful to us.

Our final witness this morning is Mr. Sam Mercantini, assistant superintendent of public instruction from the State of Indiana, and a good friend of the chairman and the subcommittee.

STATEMENT OF SAM MERCANTINI, INDIANA ASSISTANT SUPERINTENDENT OF PUBLIC INSTRUCTION

Mr. MERCANTINI. I am here representing the State department of public instruction of Indiana, speaking on behalf of the superintendent, John Loughlin.

I would just like to summarize by saying that the State of Indiana is very interested in the proposal, H.R. 33 and H.R. 3606. We certainly support it for several reasons.

The main reasons we support this are—Indiana is involved in many of the types of things planned for the advancement of education.

We are currently involved in experimental schools.

We are proposing Indiana be the central location as a dissemination center for research educational information within the surrounding States and also Wisconsin, a total I believe of six States.

We think that this is very important because of our endeavors in the 3 first months in office we found there is a great deal of educational material and information available. However, no one has brought it together. No one has in any sense of the word cataloged it so the people who should have it can have easy access to it.

Indiana has applied to the Office of Education for funding for a Midwest educational center in order to do this.

The very last point I want to make is sort of a wrap-up of things said by people before that I agree with and we in Indiana agree with.

That there is a commitment on the part of the people in the Hoosier State for educational excellence.

We evidenced this by voting for a gentleman, my immediate superior, who has promised to remove education in Indiana from the hurly-burly that is often involved in our political system.

If we can do this, if we all work and if it is suitable to come up with a bill for a National Institute of Education then Indiana will join with you and the appropriate agency and the people of Indiana will support the superintendent in any efforts in this direction.

That is a very quick summary.

Mr. BRADEMAS. Thank you very much, Mr. Mercantini, for your excellent statement. I congratulate you.

I am aware, of course, of the kind of vigorous leadership that Indiana's State superintendent of public instruction, John Loughlin, is giving to education in an State just as is the case here in the State of Illinois with Dr. Michael Bakalis and with Wilson Riles in the State of California and John Porter in Michigan.

I must say that it is very encouraging to me to see younger leaders springing up in this important State office.

I think that this development makes it a lot easier for people like me who have been somewhat skeptical of the leadership the State governments have been giving in educaction, to join my friends like Mr. Hansen of Idaho in hoping that a better day is on the horizon.

Could you just spell out a little more the proposed Midwest Information Center? I was very glad to see you put the emphasis on dissemination.

You have applied for support for this program?

Mr. MERCANTINI. We have.

For your information I will submit for your records our application for this. The application is in the sum of $380,000.

This will cover the States immediately surrounding Indiana: Ohio, Kentucky, Michigan, Tennessee, Wisconsin and Illinois.

This will be to set up a permanent office. If we are funded in this particular aspect we envision Indianapolis as the permanent location to collect all kinds of educational research, to collect all kinds of information in the field of education, not only research but just detail material educators should be able to have access to and to then supply this to the States in the Midwest region.

This would be both a program where people could write in and ask or phone and we could mail it out or get it to them or they come in on assignment and look over what our resources would be and borrow anything they may have use for.

Mr. BRADEMAS. I might ask you one other question. You heard Dr. Bakalis remark on the difficulties he is encountering in the Illinois State Legislature in getting funds for research in education.

Mr. MERCANTINI. Yes.

Mr. BRADEMAS. Are we more enlightened in the State of Indiana in this respect?

Mr. MERCANTINI. No; we didn't even bother to apply. We are having problems just keeping the schools open in the State of Indiana.

Mr. BRADEMAS. This is very distressing to me as a citizen of Indiana, but as an Indiana politician I had better not venture any further comment. This is a bipartisan bill we are working on here today.

I will thank you for your excellent statement, Mr. Mercantini and hope you will convey the greetings of this subcommittee and my own to John Loughlin.

Mr. Hansen.

Mr. HANSEN. Thank you, Mr. Chairman.

I would also welcome you, Mr. Mercantini, and ask you to convey greetings to Mr. Loughlin. I had the pleasure of meeting him some weeks ago at Atlantic City.

You heard the testimony of Dr. Bakalis?

Mr. MERCANTINI. Yes, I did.

Mr. HANSEN. I am interested in your comment on the basic thrust of his testimony and particularly his recommendation that there be a very large State loan and the program be very largely State oriented.

Mr. MERCANTINI. If I could just give you Indiana's experience again, in 3 months' experience in the office, if we were to engage in detailed research in education Indiana we would need a huge amount of funds, to be very honest with you.

We analyzed the 297 people now in our department. And 82 of those are funded by the State of Indiana. The rest are funded by the Federal Government.

We have 50 other people we do have some type of control over in the State of Indiana. And these are paid by Federal funds also.

Of these 82 we find all kinds of clerks and a huge proportion in the school lunch program.

What I am saying is if we are going to give Indiana the idea of doing educational research you will have to give a great deal of money, a great deal of staff.

I think it would be better to do it on a regional basis rather than in one State.

In Indiana there are 1.2 million children in the public schools. This would be large enough to come up with a meaningful research if we had the staff, if we had the time and resources. If you pool several States in the Midwest and give them resources and work out some kind of a joint arrangement where they could compare and come up with similar systems in several States they could be compared very easily with one another.

I think it would be a better program.

Mr. HANSEN. To be initiated by the Federal legislation or to be the result of initiatives and developments among the States themselves?

Mr. MERCANTINI. Well, it could happen either way. One of the proposals I will also leave for the record is an experimental school proposal put forth by Indiana University. They list 10 different schools in 10 different States.

The university has already made contact in working out some type of an arrangement and giving the nature and personalities of various superintendents in five or six States in the Midwest. We would work it out among the superintendents themselves.

Mr. HANSEN. Thank you.

Mr. BRADEMAS. Thank you very much.

The Chair would like to ask unanimous consent to insert at this point in the record the text of a statement by John E. Desmond, president of the Chicago Teachers Union.

(The statement referred to follows:)

STATEMENT OF JOHN E. DESMOND, PRESIDENT, CHICAGO TEACHERS UNION, CHICAGO, ILL.

I have asked for the opportunity to present a statement to you today on behalf of the more than 25,000 teachers who work in the Chicago Public Schools System.

On their behalf, I thank you for the courtesy of listening to our and their concerns.

Too often the concerns, the experience, the views of those who work in the classrooms have been ignored.

Too often national, state or district-wide educational programs have been developed without the advice of the practitioners.

In recent years hundreds of new schemes for upgrading instruction in our schools have been handed to the teacher who is told on the opening day of school that this is how you do it.

The assumption has been that the teacher is a technician, who given the right kind of materials and programs, can teach children properly. If the hoped for results don't occur, then the fault must lie with the technician, not the program.

That conclusion is a naive one. It ignores educational research into the process of learning one of the most complex and least understood functions of the human personality.

It ignores the reality of what happens behind the classroom door. It ignores the role the teacher plays in stimulating that process of learning.

But the conclusion is partly right. The breakdown in the success of a specific program often occurs in the teacher's use of the new materials and the specific teaching method.

However, if you will re-examine the evaluation data of these hundreds of innovative programs you will find that the teacher who is successful with this new "innovation" is the teacher who was also successful with the "old" approach.

The United States Office of Education's immense Cooperative Research Program in Primary Reading Instruction provides ample documentation for that observation. That research showed clearly that regardless of methods or materials used, some teachers consistently produce whole classes of pupils who read significantly better than others.

And that brings me to the major point of my presentation.

A National Institute of Education, if it is to have any impact on the quality of the schools must concentrate on finding answers to these unanswered questions:

What are the qualities of a good teacher?

What kind of training produces good teachers?

What kind of support services, materials and programs are crucial to a teacher's success in the classroom?

We think we, the practitioners, have found some of the answers. We would like the National Institute of Education to pursue the ways and means of verifying our conclusions.

We believe that effective teaching is the result of effective pre-service and in-service training—training in its broadest sense of a continuing developmental process.

We have recognized that concept as valid in the education of children. We believe it is just as valid in the education of teachers.

Educators have long recognized that children often learn as much or more from their peers than from their instructors if the atmosphere and conditions in the classroom are conducive to this kind of productive interchange. We believe it is just as valid to apply this principle to the on-going development of the professional skills of the teachers in the school.

As practitioners we have learned that children get more excited, more involved and consequently do better if they have a share in planning what you do in the classroom.

We believe this condition is a prerequisite for retaining enthusiasm for teaching in teachers.

That is what we practitioners "know" from our experience.

We have had great difficulty, however, in getting anyone to understand the connection between effective training, effective teaching and successful students.

So, we finally tried another course of action—we presented a demand at the bargaining table to set up model experimental programs that teachers had a hand in designing.

Nationally that is referred to as the American Federation of Teachers' "More Effective Schools Program."

In Chicago we call it Project READ.

In each city where Unions have won the right to start this kind of program, the program design has been a little different.

We think that is good but it gives educational researchers a few headaches. Project READ, now successfully implemented in three schools in Chicago, has three things in common with other More Effective Schools programs.

1. Teachers helped design the program. They weren't handed a design and told that what you have been doing was wrong, this is what you should do.

2. Each program is developmental—it changes as the teachers, in working with each other, the school administrators, the parents and the other professionals on the staff, develop their own perceptions of what their children's needs are, how well the materials match the children's needs and what other kinds of materials or approaches can be used.

3. This development of the teacher's own skills is viewed as an integral part of his professional responsibilities—in the schools within the school day.

None of the Project READ or MES programs can make extravagent claims like having raised children's reading test scores two grades in two months.

We never expected them to do so.

The role of decision-makers is new to teachers. They have to do some painful groping to find satisfactory answers.

Further, the program is one of the most revolutionary in education today. It attempts to upset nearly all of the old traditional roles the principal, the teacher, the student, the counselor, the librarian and the parent play in our schools today.

Ours is a pragmatic approach to find realistic answers to pervasive educational problems. We need to find a way to bridge the gap between the pragmatic educational practitioners and the educational theorists.

If the National Institute of Education is to be a help, it must, unlike most research institutes today, be concerned with the practical aspects and applications of learning theories as they apply to the education of children and as they apply to the education of children and as they apply to the education of teachers.

A natural liaison would be in the Institute's cooperation in research, evaluation and development of the model experimental school programs which have been initiated by teacher unions.

And the Institute itself, if it is not to become an island isolated from the realities of American classrooms must use the practitioners' experience at every stage of its own development as an institution.

We mean not only educational administrators and those in the education industry but those who are in the classroom and are practically and pragmatically testing out the educational theories—the teachers.

We are asking that teachers be invited into the planning councils of the National Institute of Education, that the teachers' experience in the classrooms be used when educational researchers start talking about how to evaluate programs, how to set up programs to test out innovative approaches and what kind of model experimental programs ought to be tried.

One last plea—please do not use the need for funds for educational research as an excuse to cut back funds for school programs serving this generation of children.

(Mr. Mercantini's prepared statement of material follows:)

Testimony of Sam Mercantini, Assistant Superintendent of Public Instruction, State of Indiana

Mr. Chairman, Distinguished Congressmen, It is a pleasure and an honor to have this opportunity to testify before your subcommittee on important issues of educational research, development and innovation and upon the critical question of how educational innovations are transfered into being in the schools. My name is Sam Mercantini, and I serve as Assistant Superintendent of Public Instruction in the State of Indiana. As such I have the pleasure of working with John Loughlin, an educator of great character and ability and a man whose election to the post of Superintendent of Public Instruction last fall was symbolic of the widely felt need for change in American education.

Without delving into politics, let me report to you that Mr. Loughlin was elected in Indiana with a sweeping mandate for educational change from the people of the entire State, I know that it is common for newspapers and commentators to dwell upon the fact that voters give vent to their dissatisfaction with our

present educational systems by voting down bond issues. It is a pleasure, by contrast, then to report this instance—paralleled by the election of Winston Riles in California and John W. Porter in Michigan—when voters showed their faith in the future of our educational systems by voting overwhelmingly *for* a man committed to progress and evolution.

Education in Indiana faces a number of challenges, and we have programs on a number of fronts.

But two of our initiatives are particularly germane to the work of your subcommittee today, Mr. Chairman, and it is to those that I shall devote the rest of my testimony. The concern *experimental schools* and the *dissemination of innovation.*

Experimental Schools

The Experimental Schools program will, of course, be a part of the National Institute of Education when it comes into being, so I think it might be interesting for you to hear testimony about the meaning of such a program to a State like Indiana.

The fundamental fact which confronts any school officer is the inflexibility of his budgeting.

Unlike business we have no elastic "promotion" funds, no flexible "development budget" and no arbitrary "discretionary" funds. Thus the manpower and the thinking time to start new developments has to come out of the effort of already overburdened administrators.

In such a situation the few tens of thousands of dollars available for planning grants through the Experimental Schools program can work wonders

Since the first round of calls for "expressions of interest" by the Experimental Schools program many programs have been developed by Indiana school districts. While a few of these have been discarded because they involve less than the 2,000 students required by the Experimental Schools guidelines, there nevertheless remain seven proposals for genuinely comprehensive experiments, and these proposals are before the Office of Education at the moment.

These proposals, diverse and exciting every one, are from the following school authorities:

The East Chicago, Indiana Public School System: "Television Communications Approach to a Multi-Cultural Experience for a Community in the Urban Condition."

Vigo County School Corporation: Letter of Intent for Experimental Schools Program (Career Development K–12)

The School City of Gary Indiana and Public Management Corporation: Letter of Interest for a program with "a performance oriented organizational structure; a managerial, as opposed to administrative, approach; a full-year, full-week, mult-age-level, commuunity based utilization of time space; a self-developing instructional management team; and a heuristc. Multi-disciplinary, life oriented 'curriculum.' "

The Metropolitan School District of Wabash County: Letter of Interest for "developing an individualized instruction program."

The Monroe County Community School Corporation: Letter of Intent for individualized approaches at all levels and to allow pupils to move through the instructional program at rates which are appropriate for them as individuals."

The Division of Curriculum and Supervision, Indianapolis Public Schools: The Shortridge Total Education

The Indiana University Foundation: Letter of Interest for "the creation of an Ad Hoc Community of Alternative Schools."

In this group of proposals, Mr. Chairman, there is exhibited a creativity, a directness of approach to needed social change and a dedication to the cause of education of which any State would be proud. Indiana, Mr. Chairman, *is* proud of the school authorities who have compiled and submitted these proposals.

Let us briefly survey the breadth and depth of these proposals to gain an idea of what they suggest for the future of American education and the tasks that lie before the proposed National Institute of Education.

In East Chicago we find a variagated community of startlingly low income. 34% of the pupils there come from families whose income qualify them for Title I guidelines. Many are of Appalachian stock, others are Puerto Rican. Chicano and Black. The proposal of the Public School System is that the diversity of culture be not merely accepted: it is to be the core concept of the educational curriculum. Further, the medium for the multi-cultural school experience is to be the most advanced technologies possible.

Starting with the equipment already available in the studio of the Joseph L. Block Junior High School, a television studio, the school authorities intend to broadcast a multi-cultural curriculum to five schools in East Chicago.

The community, moreover, is to be involved in every stage of the creation of new curricula. At one extreme this will mean individuals hired as "cultural resource staff." At the other end of the spectrum it might mean, for instance, that a Spanish merchant finds himself discussing prices in arithmetic classes across the city through the wonders of videotape and closed circuit cable-casting.

The projected cost increment of this adventurous and valuable program is $345,200 over and above the city's present educational budget of $9.8 million. This is a mere $3.5% increase, yet it represents a commitment to innovation which could have the most beneficial effects for the coming generation.

Naturally, I very much hope that this proposal will be funded as an Experimental Schools project.

Just as worthy is the proposed Career Development Program originated by William J. Hamrick of Terre Haute for the Vigo County School Corporation. Hamrick notes that schools in general are directed to the needs, aspirations and reward structures of the "model" child, the middle class child. While this approach is good for the many children it fits, it ignores many.

In his area, he points out, "children while enrolled in the formative elementary school ages are directly influenced by a lower-middle to lower socioeconomic value system and an ethnocentrism developed from an Ancestry of central to southern European immigrants."

The area in which he is working is a former coal mining area with a good deal of unemployment and underemployment. Significantly, here, as in East Chicago, the school officials intend to base future experimental programs upon analysis of the cultural biases in the local culture; rather than seeing their role as "remediating" the culture in place, they see the dominant social influences as factors to be addressed frankly and directly in their own terms.

To take a third example of these programs, Gary, Indiana, proposes to continue and expand its experimentation with contracted operation of schools and to expand the realm of experimentation to include a voucher program. Frankly admitting that "Our system no longer serves the present population of Gary and perpetrates underachievement, poverty and despair," the school trustees go on to say "We confidently expect that a radical program to change Gary's school system will not falter for lack of board of administration commitment."

With your permission, Mr. Chairman, I submit the East Chicago, Vigo County and Gary Letters of Intent for inclusion in your hearing record as typical of the educational experiments which Indiana authorities are hoping to carry forward.

Such experiments, Mr. Chairman, are the very stuff of reform and renewal in education and in my opinion they should be high on the list priorities for the proposed National Institute of Education.

Dissemination of Research Results

As you well know, Mr. Chairman, research and experimentation cannot have an effect on education if they remain mere results reported and filed in a drawer some place.

Yet local school systems in the State of Indiana do not have the financial resources to set up programs that would enable their personnel to make effective use of the body of knowledge now being developed in the field. And at the present time there is, unfortunately, no central facility in Indiana with the capability of staff expertise to provide the extensive collection, categorization, coordination and delivery of information that is needed.

In a related area, coordination and delivery of services presently available within the Department of Public Instruction—as well as other State and Community agencies—is lacking. Because of the growth in services we provide local schools and school authorities we have offices to provide assistance in many special areas including curriculum, special education, vocational education, pupil personnel, instructional media, facilities inspection and research. These services, however, have each evolved out of particular needs at particular times. They might not, in fact, be available to particular practitioners at particular times simply because communications between the central agency and the local school or classroom have become so complex.

For this reason we are at this moment proposing the funding of a Midwest Educational Information Center to serve Indiana, but also to service Michigan, Wisconsin, Illinois, Ohio, Kentucky and Tennessee.

As presently envisaged, the development of the Educational Information Center will take place in three phases; planning, pilot operation, and full operation. The first two phases will require a total period of approximately 18 months divided into two equal parts. Realization of the operational phase of course, will depend on the success of Phases I and II and to some extent on the availability of additional support.

The following sequence of activities approximates the order of development of staff and services. Some activities, of course, will proceed simultaneously. Some will be long term or indefinite, and other finite, but in general the plan procedure is described below.

1. PHASE I: PLANNING

When the appointments of the Director and Assistant Director have been confirmed, an immediate next step will be to secure facilities. Simultaneously, the formation of the rest of the professional staff should begin so that these specialists, in particular the reference librarian and data processing specialist, can participate in selecting equipment and materials relating to their responsibilities. Because it will serve as a laboratory for staff orientation and training, the facility should be at least basically equipped as early as possible.

When ,the professional staff has been formed, a series of visits to successfully operating information centers will take place. So that coverage will be as extensive as possible, the staff will be subdivided into three groups, each of which will visit a different selection of three sites. Observations and reactions will be systematically recorded and pooled for use in completing the Indiana facility and making further plans. This exchange of information will take place in staff workshops that will occur after site visits. Discussion and organization of each experience will increase the value of the next experience as well as providing a useful set of records.

Also at this time the staff will begin an intensive public awareness program within the educational community of the state. The statewide Advisory Board will be appointed and include representatives from local education agencies throughout the state, higher education, school boards, professional organizations, and other agencies directly concerned with education. Members of the Advisory Board will be involved in some staff workshops and will also be present in their areas at local "drive-in" conferences, a series of regional meetings conducted by the Director and Assistant Director to provide initial orientation for all educational personnel to the new program. These conferences will be followed up with systematic visitation to all local systems throughout the duration of the project. Other functions of the Advisory Board will be to meet periodically with project staff, provide evaluation, and make recommendations concerning procedures.

The Educational Research Specialist will begin to work closely with a core of field consultants, recruited on a part-time basis from the various service divisions of the Department of Public Instruction. These consultants will also participate in statewide communication and training efforts. In addition, they will help to identify specialists in other agencies throughout the state, including colleges and universities, who can be contracted to provide consultant services locally. Ultimately, a statewide network of available consultants representing each major field of expertise will be developed assuring that no back-up of requests for services will occur.

The Education Research Specialist will also initiate a systematic survey of needs throughout the state. Questionnaires will be sent to high level administrators in every Local Education Administration, who in turn will be asked to survey the body of professionals under him for their input. These questionnaires will be sent out in advance and collected at the regional drive-in conferences. following further discussion of the nature and goals of the program. The information obtained in this way will be supplemented by personal interviews, and together these sources of information will provide the basis for setting priorities for collection of materials, acquisition of equipment, development of data processing operations, and provision of other services.

At an early point in the planning phase the Data Processing Specialist will begin working with the Reference Librarian to design an information storage and retrieval system that will accommodate all materials as they are shelved. He will also begin to categorize service areas and act in an advisory capacity to public schools as they become familiar with the system.

2. PHASE II: PILOT OPERATION

The pilot state of operation will involve implementation of the services developed so far. At this point operations will be concentrated in the areas of greatest population density, with facilities centrally located. This location will provide access to school systems located within reasonable driving distance and representing both rural and highly urbanized settings. Defining this area as the pilot field does not, of course, exclude other areas in the state from services. It should be emphasized that conceptually the Center is not a new organ to be grafted onto the present structure of the Department's present stage of growth and organization. The center itself will be physically, a new entity, and as such must begin serving a limited area and expand systematically as its facilities are tried, evaluated and made complete. Many educational information services are already available from various segments of the educational community, and from the beginning the transition to a central organizing agency will involve these segments of the educational community of the state. The school systems will receive systematic communication, be involved in education and evaluation programs, and of course, have the advantage of close proximity to the initial facility.

For the specialists on the staff the work of Phase II will be largely a continuation of assignments begun in Phase I, the acquisition of materials and equipment and the implementation of procedures to expedite their use. By the completion of the Pilot Phase it is expected that a comprehensive shelf collection of research information and resources will include a core collection of professional volumes for circulation; up-to-date sets of key professional periodicals; basic education indexes and abstracts; government newsletters, bulletins, information kits and other documents relevant to the field of education; subscriptions to both government and commerical research services; publications of leading education associations; selected monographs and other documents on microfilm; a complete file of state legislation relating to education; a curriculum resource section, including a collection of basic textbooks and selected syllabi and other materials successfully tested in the classroom; bibliographies; and, of course, a complete collection of all ERIC materials and publications of the U.S. Department of HEW, Office of Education and Office of Economic Opportunities. Also to be developed, though, possibly not within the period of Phase II, is a collection of multi-media materials such as films, film strips, and audio and video tapes. Equipment will include computer hardware, copying facilities, microfilm readers and reproduction machines, standard furnishings for browsing and study, and audiovisual devices such as tape players and projectors.

The individual making use of the Center facilities will receive assistance in both computer and manual searches of the collection. Requests for assistance can be mailed, telephoned or made in person. Computer output will be reviewed for relevance and supplemented by manual searches through unprogrammed resources, the product being a software package which might include the computer output, copies of other abstracts and relevant articles, reference to other sources of information including resource persons, bibliographical references, and audio-visual materials where appropriate. As Phase II develops, procedures for making software packages available to out-of-state agencies will also be piloted.

As an important port of this information service, the Data Processing Specialist will conduct training workshops in the field to educate individuals in the use of the system being developed. Initially these workshops will involve school administrators who will transmit their training to their professional staff.

State personnel whose needs extend beyond the acquisition of information will have access to the consultative services included in the structure of the Center. With the provision of an information package a consultant might be dispatched to the originator of the request, or the information package might be dispatched to the originator of the request, or the problem might require a more extensive consultative arrangement. Such an arrangement might involve meetings with staff field consultants, identification of possible solutions, mutual agreement on the best solution for the given situation, selection of appropriate services and materials, and arrangement for further consultative assistance in integrating these into the school or classroom situation. This itemization of steps is, of course, an abstraction which will change in every actual problem setting and serves only to indicate the scope of assistance to be made available.

Although field consultant services as described above will be available only professionals within the state, the Center staff will also provide liaison with out-

of-state representatives as they become organized to make use of the information services. Also at this time a reasonable fee or subscription schedule for other State Education Agencies will be devised to make the continuation of these services financially feasible.

3. EVALUATION

Evaluation will be an important part of Phase I and II, consisting of both a continuing monitoring process and formal assessments at given points of the development of the program, including evaluation by outside agencies. The Educational Research Specialist will be responsible for designing and implementing formal evaluation procedures. Generally, these will entail an initial survey of needs in the area of educational information and services (described above) and follow-up surveys to measure the extent to which needs are being met and areas (both topical and geographical) in which they are not. Primary techniques will include questionnaires, site visits with structured interviews, tabulation uses of services and materials, and individual staff reports and observations. Periodic progress reports circulated among the staff will record these findings and provide the basis for discussion and planning as the program develops.

In as much as divisions now existing within the state agency will be involved in the provision of basic services, their own methods of evaluation will also be instrumental in achieving overall assessment. Individual users of the service will provide feedback, and consultants will informally report any observations or reactions obtained in the field. Both the process (the operations themselves and the various staff functions) and the product (the overall structure as it evolves and accomplishes the goals stated in the objectives) will be subject to close observation. Evaluation obtained during Phase I will influence the structure of Phase II, and all evaluation will provide the basis for going into the fully operational Phase III. Data will also be retained for the purpose of accumulating a long-range profile of both client and Center characteristics with a view toward continuous improvement of materials and services.

Naturally, Mr. Chairman, we see the two initial Phases of the Center's work as research and development, and as such we fully hope that they will be fundable by the National Center for Educational Research and Development under the Cooperative Research Act authority and the authority of the Elementary and Secondary Education Act.

But as I look to the future I am aware that the regular operation of such an institution will be to carry out perhaps the single most important phase of the research task: the dissemination of research results. Would it be overambitious to suggest that a network of such dissemination institutions might legitimately become part of the apparatus of the National Institute of Education?

CONCLUSION

I have outlined here, Mr. Chairman, the hopes of Hoosier educators for new educational forms to be created as experimental schools, and I have outlined the shape and process of an institution we hope to help create, the Educational Information Center.

We at the State level are taking part in the same work as those at the Federal level, yourself included, who are working to create the National Institute of Education. Let me join you and the members of your subcommittee, Mr. Chairman, in hoping that these initiatives together can mesh to remake American education.

If you have any questions, I shall be glad to answer them.

APPLICATION

EXPERIMENTAL SCHOOLS PROGRAM

U.S. OFFICE OF EDUCATION

Washington, D.C. 20202

TELEVISION COMMUNICATIONS APPROACH

TO A MULTI-CULTURAL SCHOOL EXPERIENCE

FOR A COMMUNITY IN THE URBAN CONDITION

1. (a) The East Chicago, Indiana, Public School System is a school corporation serving a highly industrialized community. The city of East Chicago itself has all the typical problems of a city in the urban condition. Its population is declining although new arrivals are drawn to the city from the rural South, Southwest, Mexico and Puerto Rico. The school system is beset by typical inner-city problems, namely, poor achievement in skill subjects, hostile attitudes of alienated pupils and a professional staff that in many instances does not understand the needs and desires of disadvantaged minority group pupils.

The school populus is 10,165 pupils housed in eleven elementary schools, one junior high school and two high schools. Of the total pupil population, 33% are Spanish surnamed, 40% are Negro and 27% Caucasian. The pupil population is decreasing but there is much intra-city transfering which adversly affects the learning process. It is estimated locally that more than 50% of the pupils in the school system are at least six months below grade level norms in reading achievement. The school system has been beset recently by student walk-outs and boycotts at the senior high school level. There are indications of further pupil unrest at the junior high and elementary grade centers. In addition to the three broad racial and ethnic representations of Spanish, Negro and Caucasian, there are pupils representing every country on the continent of Europe. European ethnic groups represented approximately twenty-five. A total of fifty-seven racial and ethnic groups are represented. Threading its way through this diverse, disadvantaged pupil population is the problem of non-English speaking pupils, most of whom are Latin American. The other non-English speaking pupils are Greek, Serbian, Croatian and Hungarian in origin. This tremendous diversity in culture impinges on the learning situation immediately upon the pupils initial introduction to our school system.

(b) The School City, in the past, has proved it's competency to design worthwhile educational projects by being funded with a Headstart Program, MDTA, a Neighborhood Youth Corps Program, a Settled-Out Migrant Education Program, ESEA, Title I and II Programs and a Work-Study Program for Disadvantaged and Handicapped Youth and a Juvenile Delinquency Program. The School City currently has on file with H.E.W. in Washington proposals for ESEA, Title III and Title VII Projects. The School City has also taken part in EPDA Projects.

In addition to having the expertise necessary to design and implement the above named federal programs, the School City has operational, in it s Joseph L. Block Junior High School, a very sophisticated, professional quality television studio that is used for live television broadcasting in addition to video taping of

educational programming for retrieval purposes. The television installation, a complete closed circuit television studio, includes the following equipment:

1. Two Vidicon Studio Cameras on dollys
2. Video Control Console

    a. Remote Control Panels for viewfinder cameras

    b. Video Switching System

    c. Tektronix 529 Waveform Monitor

    d. EIA Sync Generator

    e. Video Distribution Amplifiers with sync mixing

    f. Pulse Distribution Amplifiers

    g. Audio Mixer

    h. Video Monitors

3. One Switcher-Fader

4. Two Pulse Distribution Amplifier
5. Two Video Distribution Amplifiers
6. Three Audio/Video Modulator
7. Synchronizing Generator
8. One Multiplexer System
9. Monitor Speaker
10. Monitor Amplifier
11. Television Tape Recorder-with VTR Table-1" tape
12. Two Audio Channels
13. RF Modulators
14. One Empire 488 Turntable With Cartridge

2. The overriding problem is the racial and cultural alienation, isolation and polarization of an urban community. The physical and psychological decay inherent in the urban condition demonstrates poor skill subject achievement. All these conditions are manifest in the typical symptomatology: poor attendance patterns, poor self-concept, hostility, juvenile delinquency and a high incidence of drop-outs. This is all related ultimately to its base cause as seen from a psychological perspective which is a poorly developed self-concept. This poor development results in the lack of coping mechanisms. These coping mechanism deficits result in inappropriate reactions to the stimuli of the urban condition with its attendant physical and psychological pressures.

(a) These problems are attendant to the urban condition and are replicated throughout the country. The attempt at improving a cultural self-concept is not typically done with the large group scale we are proposing in this project. Never before has a community been ready for the type of program planning in this design and neither has the technology been available previously in an urban site.

(b) The target population in this case, East Chicago, Indiana, with its selected target area evidences all the problems. This is the urban condition; these are the problems.

(c) Mass communications media has demonstrated that it is a viable vehicle for breaking through barriers of hostility, learning problems and lack of motivation while reaching large groups. An emerging educational trend has illustrated the validity of a multi-cultural experience as a basic need for growth in a search for individual and cultural identity. Active community participation has been seen as an absolute necessity in creating a positive image of the schools in an urban setting. These three themes, community involvement, a multi-cultural experience and modern communications techniques all speak to a resolution of the problem: polarization and decay of the urban condition.

3\. (a) The target population to be involved in this design numbers approximately 5,000 pupils, grades K through 12 housed in five elementary centers, one junior high school and one senior high school in one geographic section of the total community. Of these approximately 5,000 pupils located in the target community, 1,717 or 34% come from low income families and meet Title I income guidelines.

(b) The social economic aspects of the target population and of the community indicate that this is a typical inner-city population in that most of the families reside in housing units that are either dilapidated or deteriorating and are over crowded. There is a high concentration of welfare and township relief recipients in the area. The rate of unemployment is unusually high for an industrialized urban community of this type. There is a basic language communications problem among most of the inhabitants of the target area and they suffer the social implications that are a natural outgrowth of economic and cultural deprivation. Most of the residents of the target area exhibit a ghetto life style in which they view outsiders, whether they be educators or not, with distrust.

(c) In comparison, the target population to be involved in this design is a microcosm of the total clientele served by the school system differing only in that the social economic problems that are common in the entire community are present to a greater degree having greater impact upon this select group.

4. (a)
1. The development of a mass communications approach to a multi-cultural experience.
2. Involve an already aware community in a broadly based multi-cultural experience.
3. Improve the self-concept of the racial/ethnic residents of East Chicago.
4. Recognize the interdependence of socially and economically different racial groups
5. Develop the target population into a total community of teachers and learners
6. Reduce pupil learning/reading problems, alienation, hostility and motivational deficits

(b) The project is an outgrowth of community desires and needs as it made demonstrably clear to the schools the need for a program to reduce racial tension and polarization. The community will have an active partnership on the Project Development Team in the planning, programming and production of a multi-cultural experience utilizing modern communications media. As the project moves to its culminating phase, the community will assume the leadership role in the planning and production of the extension services, i.e. adult and pre-school programs.

(c) This projects basic thrust is the implementation of a locally designed experiential, multi-cultural curriculum delivered to a large racially homogenous groups which transcend the typical age-grade groupings. A central T.V. studio will broadcast the curriculum to the five participating school sites. This experience will initially be developed for presentation to the larger groups for participation of at least two afternoons per week. The larger teachinggroups are K-3rd grade, 4-6, 7-8, and 9-12th grades. They will be reached instantaneously and simultaneously using the video tape capability of our 4 channel closed circuit T.V. broadcast system.

The curriculum will be developed into two gross categories; a skill subject core of science, math and reading and a cultural subject core of language arts, social studies,music and art. To maintain the humanizing aspect of this cultural experience, it will be necessary to regroup the large classes into smaller discussion groups led by racially aligned staff for culminating expanding and individualizing experiences within the cultural core of the curriculum.

The central T.V. studio and the resource centers at each participating site will be staffed with professional media experts and indigenous cultural aides who will be available for assisting classroom teachers in preparing material and developing instructional strategies.

The first two years of the project will be devoted to in-service training of approximately six months and one and a half years of study of an individual's own culture preparatory to the second phase which is the cross-fertilization aspect wherein pupils will then be grouped heterogeneously by race and culture. It is seen that the initial investigation of an individual's own cultural heritage leads to a growth of self-concept. It is then a natural, logical sequence that a study of other cultures and the differences and similarities will lead to knowledge and acceptance and appreciation of those similarities and those basic necessary difference.

The project development team composition as dilineated in Figure #2, has as its bridge to the target community of teachers and learners the services of indigenous cultural aides who will be the most humanizing influence of the total project. The entire professional staff of media specialists, resource personnel and instructional teams will be certified employees of the schools. Administratively, the project director will report to the Assistant Superintendent. Because participating professional staff are members of the school, this guarantees that the project will interface with the schools total administrative and organizational structure.

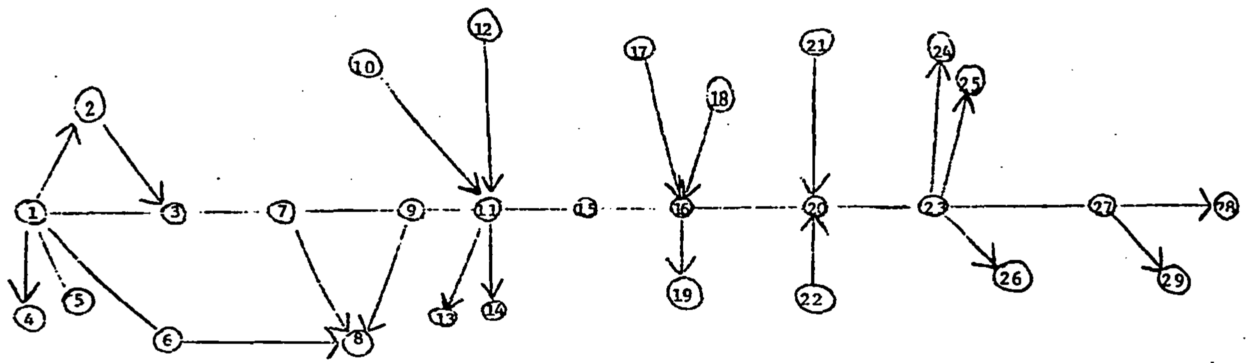
(d) The community is seen as reinforcing the curriculum via establishing direction and active participation as resource and paraprofessional staff members. The technological aspects reinforce the cultural reshaping as the program is impossible without technology's ability to reach large separated groups instantaneously. The multi-cultural aspects of the curriculum depend upon community input for leadership, direction and support as they are a function of technology's capabilities.

(e) We have previously seen with small scale pilot projects locally the possibility of improving self-concept, hence ego development. We have seen technology's success in skill achievement as it reaches large groups of separated youngsters. We have seen the efficacy of a mutually shared school-community cultural enrichment program. We have seen already the benefits of community involvement via our Title I community liaison workers, Title I Advisory Committee, Headstart Parents Action Committee, and most importantly, the Superintendents Task Force. This Task Force is a Rockefeller Foundation funded program which provides for site visits of community representatives to view viable programs which might have transferability to East Chicago. A proper and extensive mix of previsouly isolated programs which can now be put into an organizational umbrella with a broad thrust is seen as finally approaching a solution of some of the urban condition's problems.

5. Obviously, the synergistic affects of the three program components - - community involvement in instruction and curricular design, multi-cultural core curriculum, and creative use of modern communications techniques - - is greater than these components operating in isolation or limited combinations. Viewing the entire urban target community as a community of teachers and learners utilizing modern communication equipment in a reshaped curriculum stressing cultural values with new teaching strategies is a unique experimental design not previously attempted or perhaps conceived.

Figure 1. Schematic Illustration of Time Sequences Involved in

"Television Communications Approach To A Multi-Cultural School Experience for a Community in the Urban Condition"



1. Project initiation - Select Development Team (Sept.,71)
2. Complete theoretical framework
3. Finalize objectives (Oct., 71)
4. Evaluation design (Oct. 71)
5. Recruit staff
6. Start evaluation (Oct.,71)
7. Begin Pre-Service Trng. (Nov.,71)
8. Begin continuous evaluation
9. Revise pre-service component
10. Develop curriculum materials
11. Identify with own culture (March 71)
12. Large group T.V. instruction
13. Small group expanding experience
14. Small group culminating experience
15. Revise component if necessary
16. Begin cross fertilization (examine other cultures)(Sept.73)
17. Broaden scope to student activities & extra-curricular programs
18. Revise instructional strategies
19. Organize total support systems
20. Scope broadened to include Extension (Adult & pre-school) (March, 74)
21. Total Community Involvement
22. EDC type involvement
23. Refine final component (Aug.75)
24. Prepare materials for dissemination
25. Produce cultural demonstration techniques for retrieval purposes
26. Develop local financial support systems
27. Program conclusion (Aug.76)
28. Adoption of successful components into local school
29. Complete and disseminate final report

7. (a) ANNUAL INCREMENTAL COST FOR PROGRAM (Budget)

Staff		
Project Director	$	20,000.
Media Specialists (2) @ $15,000.		30,000.
Cultural Resource Staff (5) @ $12,000.		60,000.
Technician		1[illegible],000.
Secretary/Clerk		6,000.
Consultants Service		20,000.
Pre-Service (goals and objectives of programming)		
In-Service (6 months-development of curriculum materials)		
Evaluation		
A-V/T.V. Specialists		
Teacher and Community Resource Personnel		
36 teachers (part-time)		38,000.
25 aides		35,000.
Learning Materials and Supplies		
Resource materials for curriculum development		5,000.
Production materials for teacher/pupil handbooks		5,000.
Communications Equipment (hardware)		
Wiring of schools for T.V. installation		45,000.
Microwave or cable installation		12,000.
Lease for T.V. receivers (200 sets)		33,000.
Video tape and production supplies		12,000.
Portable Resource Centers (5) @ $2,500.(lease)		12,500.
Resource Center Equipment (5) @ $1,500.		7,500.
Miscellaneous hardware		6,000
Miscellaneous Costs		
Paper		700.
Printing		2,000.
Office Supplies		500.
Phone		250.
Travel		750.
Custodial		2,000.
TOTAL	$	345,200.

7. (b) Expenditure per Pupil in Average Daily Attendance, K-12

		FY 68-69	FY 69-70	FY 70-71
Average Daily Attendance		9372	9041	8876
Total Current Expenditures	$	8,034,702.	8,752,932.	9,833,198.
Expenditure Per Pupil in ADA	$	857.	965.	1,108.
Additional Federal Support of Target Population (Title I, II, ESEA; Headstart; NYC; Migrant; EPDA; Juvenile Delinquency; MDTA; Rockefeller)	$	244,529.	385,787.	410,000.

Estimate of Expenditures for Next Five Fiscal Years
(using 12% increase per year)

	FY 71-72	FY 72-73	FY 73-74	FY 74-75	FY 75-76
Expenditure Per Pupil in ADA	$ 1,240.	1,388.	1,554.	1,740.	2,088.

Although this projection for the final year, FY 75-76, appears inordinately high, it must be remembered that the 12% projection used is one that is a function of previous increases. Not only have teacher's salaries been increased significantly, but large budgetary allocations have been made for all employees also maintainance and instructional equipment and supply areas.

8. PROJECT EVALUATION

Due to the wide ranging scope of program objectives and the diversity among the receptors of program benefits, the evaluation of the constituent elements of the total project must be accomplished through the utilization of a multifaceted evaluation design. As the project is presently conceived, a number of beneficial intermediate and terminal outcomes are expected to ensue. Each outcome may be placed upon a serially accelerating time-effect line; the incremental elements (developmental stages or components) of which evidence mutually supportive functions. The entire evaluative effort must as a consequence reflect the overall project plan through its cycles of annual reassessment, planning, evaluation, and redesign. Figure 2 presents a model suggested to facilitate program planning for instructional improvement in schools participating in the project by means of a continuous evaluative effort over the five year life of the project in the Public Schools of East Chicago, Indiana.

The scheme provides for six steps in the process of instructional improvement.

1. Needs assessment through a continuous self-study of the East Chicago Public Schools participating in the project supported by inputs provided by a PROJECT ADVISORY BOARD FOR EVALUATION and, in all years following project year one, results of a criterion-referenced testing program specific to the project and over all grade levels K through 12.

2. Program Design or Revision based primarily upon planning which incorporates program objectives of three types, according to the classification system devised by the Educational Innovators Press[1], (1) behavioral, (2) instructional, and (3) institutional. This program design stage also provides a built-in evaluation system keyed to specific program objectives and to the criterion referenced achievement testing program to be developed for the project.

3. Implementation provides for putting into operation the plans laid in the program design step for initiating instructional change.

4. Goal Assessment implements the evaluation plans of Step 3 to measure program effects. Both narrow, intermediate objectives--specific to a single concept--and broad, program wide objectives are tested for attainment. If objectives have not been met in terms of the standards set in the evaluation design, the entire program is recycled beginning with Step 2; thus permitting renewed planning and implementation of the program. If objectives are met with success, program designers will proceed to the next step in the process. It is anticipated that Step 4 will be recycled at least annually for the assessment of major project goals.

5. Diffusion includes adequate publicity through oral and written communications with the sponsor and other potential users, the preparation of materials for dissemination, the development of demonstration techniques, and the mustering of additional local administrative and financial support for the program.

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[1] Educational Innovators Press, Performance and Process Objectives, Tucson, Arizona. (1970)

6. Adoption is the last step in the process of instructional improvement. It permits system-wide conversion to the new processes and technique, including the appropriation of necessary support systems.

The model provides for recycling through the entire process immediately after the achievement of adoption and systematization of the newly implemented program. Thus rigidity of curriculum is averted by requiring a continually recycling program of self-study for improvement.

Goal assessment, Step 4 in the model, bears further elaboration. This component will consist of three separate, although related, procedures: (1) product evaluation; (2) process evaluation; (3) comparisons of predetermined performance criteria with actual accomplishments.

Product Evaluation: This procedure provides systematic, vigorous, and independent assessments of the degree to which project proposals are implemented, standards are met, and goals are achieved. It will relate the project's educational product to the ongoing programs of instruction and services which are already operational in the East Chicago (Indiana) Public Schools.

Process Evaluation: This procedure permits continuous reassessments of the effectiveness of programming at time intervals ranging in duration from a single day to one week. Findings will help decision makers to modify their instructional program and emphasis. In general, process evaluation facilitates evolutionary change by assuring that all aspects of the program will undergo examination at regular intervals as well as at the termination of the project.

Performance Criteria: Under the provisions of the project proposal, elementary and secondary schools will be enabled to strengthen and improve the educational opportunities of all children served by the East Chicago (Indiana) Public Schools. However, not all of the program's objectives are of a nature which will permit the application of standard evaluative techniques. Therefore, at least a portion of the evaluative effort will involve assessing changes in behaviors and environment--factors not readily interpreted through the utilization of closely defined performance criteria--benchmarks of progress for all practical purposes. During the course of a successful program, the group or affected situation will depart from the baseline level and progress in measureable amounts toward the criterion or standard predetermined as the desired outcome.

SPECIFIC EVALUATIVE PROCEDURES TO BE EMPLOYED

Cognitive Learnings: The content of the instructional materials will provide students with experiences which are largely cognitive in nature. They will be expected to remember facts, comprehend ideas, generalize, analyze, hypothesize, synthesize, and evaluate content. Two approaches to the evaluation of cognitive learnings that will be used in the project will be objective tests--standardized and teacher-made--and essay examinations. Of course younger children will be expected to reveal cognitive learnings orally rather than through the use of written instruments.

Affective Learnings: The major objectives of the project relate to improving self-concepts, accepting different individual and cultural identities, and recognizing the interdependence of socially and economically different racial groups. As a consequence, much of the structured learnings will pertain to values, beliefs, attitudes,

and appreciations. Many of the learnings will be charged with emotion, as they will be aimed at replacing negative feelings of rejection with positive feelings of acceptance. Several methods will be used to determine the degree of progress achieved in this direction which may be attributable to the project

1. Projective techniques including sentence-completion devices and having the child respond to standardized sets of pictures reflecting human beings in a variety of life situations.

2. The Stevenson Q-Sort Technique will be utilized to assess differences in descriptors used to discuss one's own race or ethnic group and other groups.

3. Questionnaires will be devised to help assess immediate effects of individual units of instruction through the application of pre-post designs.

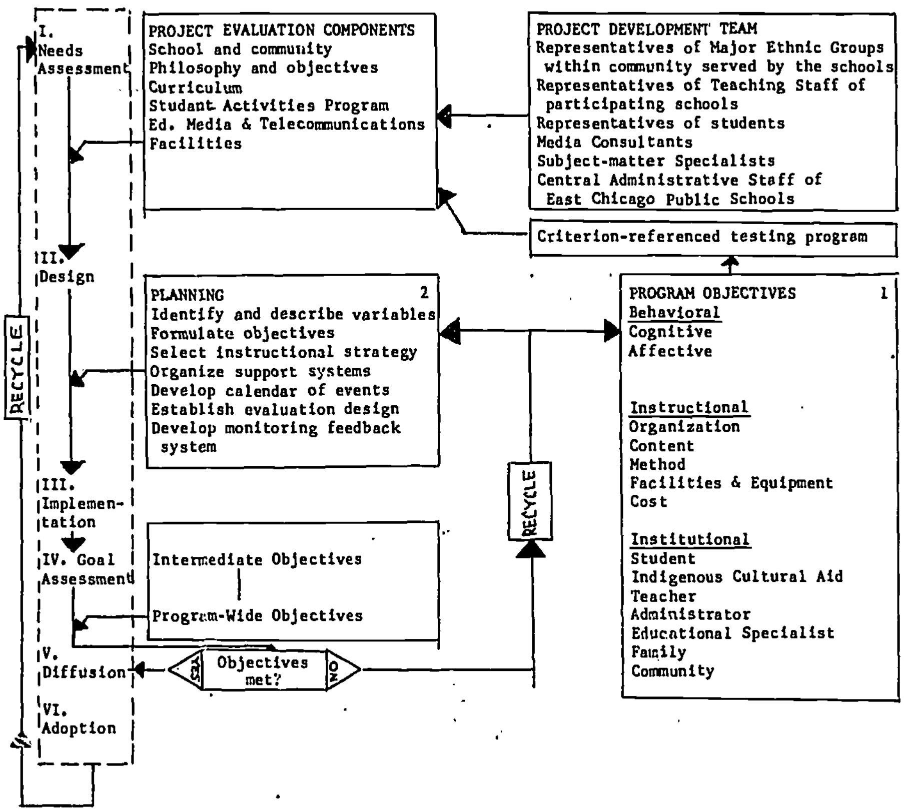
4. Structured interviews will be held with a random sample of children selected from both sexes, all grade levels, and from all prominent ethnic groups represented in the student population.

5. Teachers will utilize observational techniques in noting differences in student behaviors in a variety of school settings: (1) formal classroom situations, (2) school social and athletic events, (3) class trips, and (4) informal contacts with students of his own choice.

6. Teachers will keep systematic anecdotal records or daily logs of observations of individual students in order to identify attitudes and attitudinal change.

FIGURE 2

A Tentative Schema to Facilitate Program Planning for a Television Communications Approach to a Multi-Cultural School Experience for a Community in the Urban Condition



Key:

1. Adapted from: Educational Innovators Press, Performance and Process Objectives, Tuscon, Arizona, 1970

2. Norman E. Gronlund, Measurement and Evaluation in Teaching, New York: The MacMillan Co., 1965.

9. ASSURANCES

The applicant is a local educational agency and as such will comply with the provisions of Title VI of the Civil Rights Act of 1964 in its participation in the Experimental Schools program authorized by the Cooperative Research Act (Public Law 83-531) as amended and regulations issued persuant thereto. (45 CFR Part 151)

A LETTER OF INTENT FOR EXPERIMENTAL SCHOOLS PROGRAM

VIGO COUNTY SCHOOL CORPORATION

Terre Haute, Indiana

Prepared by:

William J. Hamrick
Assistant Superintendent of Instruction

A LETTER OF INTENT FOR EXPERIMENTAL SCHOOLS PROGRAM

1. Applicant Agency:

   Vigo County School Corporation
   667 Walnut Street
   Terre Haute, Indiana 47808

Telephone No.:	812	234-4886	59
	Area	Local No.	Extension

Name and Title of Project Director
William J. Hamrick, Assistant Superintendent of Instruction

a. On November 8, 1960, the voters of Vigo County, Indiana elected to merge the then existing nine school townships, two reorganized school corporations and one city unit into one administrative unit.

   The reorganization was a part of the state-wide plan of school reorganization initiated by the Indiana General Assembly in 1959.

   The Vigo County School Administrative Unit that came into being on January 1, 1961, is the local school agency of the State of Indiana responsible for all public education in the territory of Vigo County. The total pupil population enrolled in grades kindergarten through grade twelve for the 1970-71 school year is 22,071.

b. Competency to design and implement an Experimental School Project:

   (1) Designed and conducted the first cooperative workstudy program for mentally retarded youth in Indiana. Financed as a three year demonstration grant, Office of Vocational Rehabilitation.

   (2) Designed and implemented a three year project financed by Title III, ESEA. The project was a diagnostic-learning center for children with learning difficulties.

   (3) Co-authored the Indiana Plan for a four-university training program under Part C and D, Education and Professions Development Act of 1967.

   (4) Designed and initiated a six county joint school services project providing psychological services in prescription teaching. A packaged funding project utilizing Title III, Title VI, and local joint service funding.

   (5) Designed and conducted an intensive training program for paraprofessionals in the use of maturational encouragement techniques, EPDA, Part C and D.

   (6) Designed and initiated a training program for deaf and auditory impaired children, Title III, ESEA.

It should also be noted that the cooperation of the Indiana Department of Public Instruction, Curriculum and Pupil Personnel Services Divisions, as well as Indiana State University, St. Mary-of-the-Woods College, and Indiana University, will be involved with the proposed project.

Career Development K-12

2. Statement of the Problem

The main problem to be solved with the project would be the testing of a multi-dimensional instructional program in which the instructional approaches will be geared toward an instructional prescription based upon individual needs as influenced by social class of the school districts.

The instructional programs would follow three distinct patterns of which two would be the control groups and one the experimental.

a. A traditional oriented program utilizing a graded classroom situation with a skill development emphasis supported by the traditional pupil services. The program would be designed toward the modal class; a cognitive centered program. (Control, K - 12th grade)

b. A contingent management program with an extrinsic reward system. The instructional program would utilize behavioral modification and social casework techniques facilitated with paraprofessionals, ungraded primary and team teaching techniques. The target school serves a lower socioeconomic group. This program would be classified as affective/cognitive. (Experimental, K - 12th grade)

c. The third modal would be patterned after the Glasser Schools Without Failure. The programs would be geared toward a continuous progress of individualized instruction. The classes would be of an open concept with instructional media centers. The children to be served are from mixed socioeconomic classes. This program would be one of affective education. (Control, K - 12th grade)

   (1) This problem was chosen because of the stress for accountability associated with current trends toward performance contracting, voucher programs, and the open community schools. It is felt that professional educators must accept the fact that the types of programs most generally provided in schools today are geared toward the middle class child. The modal class has an intrinsic reward system established and is motivated toward the acquisition of the primary output of current educational practices, a cognitive product.

   It is felt that professional educators can accept the challenge being presented by management contractors and provide better programs designed to meet the unique needs of the children being served.

   (2) The target population selected for the project is distinct by nature of socioeconomic influences and as such are motivated most effectively by differing factors as indicated by position along the hierarchy of rewards.

(3) The problem is not unique to this project. However, the application would be quite universal. It is accepted that within the system there exists sub-systems and each sub-system may require differing approaches toward providing the properly prescribed educational input to derive the optimum level for an output oriented educational society. If accountability is to be assessed on the basis of the affective and cognitive products then the total system must develop multidimensional instructional programs with designs for the populations to be served.

3. Target Population:

a. Each of the three groups, the two controls and the target population are uniform. The elementary schools (3) in the study each will house 700-750 pupils. The middle schools (3) will enroll approximately 750-850 children each. The high schools will vary in size; the control schools (2) will average 2000 students while the experimental will enroll approximately 1000 students. The experimental group will comprise approximately 2500 students. Each control group will involve approximately 3500 students.

b. Vital Statistics Concerning Area Economic Condition

County	Pop.	Percent Rural Pop.	Median Fam.Income	Pop.Per Sq.Mi.	Area in Sq. Mi.	School Enrollment
Vigo	108,458	24.9	5,312	261.3	415	23,085

County	Cost Per ADA K-12	Adjusted Assessed Valuation Per ADA K-12	Percent Unemployment	Percent Population Earning Less Than $3,000	Percent Population Ages 5-17 Eligible for Title I
Vigo	$ 715.00	$10,576.00	7.0	21.9	9

c. The target population had an average family income of approximately $3,500.00, while the median family income as determined by the 1960 census for Vigo County was $5,312.00. As near as can be determined from incomplete data of the 1970 Census, the county average family income is $9,604.00. The target area average family income is less than $6,000.00.

The target area population is all white of lower middle or lower socioeconomic status. At the junior high and senior high level there is a commingle with a range of socioeconomic classifications while remaining all white.

The target area children while enrolled in the formative elementary school ages and stages are directly influenced by a lower middle to lower socioeconomic value system and an ethnocentrism developed from an ancestry of central to southern European immigrants.

The major industry of this area until the early 1930-40's was coal mining. It no longer maintains any localized industries.

4. Project Description:

a. The goal is to demonstrate the necessity for developing varying instructional approaches within systems based upon the dominant social influences within an area, an approach for individualizing the instructional programming based upon educational prescriptions as determined by individual analysis.

b. The project will be directly related to the needs and attitudes of the community since the project will be focusing upon a continuum of career development from K-12th grade utilizing the resources of the community.

A School-Community Advisory Committee has been established in an attempt to maintain educational relevancy.

c. The target schools will attempt to provide programs based upon the individual needs of the children. The curriculum will be prescription teaching.

The staff will include lay personnel performing a variety of functions. Initially they will be utilized in the collection of individual background information for each child. A trained social worker will supervise and train the personnel in collection of home study information.

The school psychologist will work with the paraprofessional staff in administering measures of cognitive skills and abilities.

The school nurse will supervise the compilation of health data.

The certificated classroom teacher will function as the instructional manager working with a team of paraprofessionals providing direct instructional services to small groups.

In-service training for staff will be continuous in conjunction with the project. University personnel will be utilized in this effort.

The project staff will function as members of individual school staffs responsible to the building administrator.

The project will be coordinated by one person who is responsible for the continuum of career development through all levels of K-12.

d. Each component of this project will be compatible and mutually reinforcing since the direction of all services will be toward individual children based upon a planned prescription.

e. The rationale for this project is that each child is a unique individual and that children from differing social backgrounds are functioning on entirely different value systems.

The middle to upper middle class child is motivated primarily by a basic intrinsic reward system which is being constantly reinforced by out of school experiences and as such can function equally well within differing instructional systems. The two control models are extreme methodological approaches.

The experimental group will be receiving constant positive reinforcement by a very personalized instructional model. The design of this project is to enhance the extrinsic rewards while focusing directly upon the needs of each individual child.

The basic assumption of this project is that the trained teacher must alter her services from one of managing children directly to one of managing paraprofessionals. The certificated teacher will need to provide the humanization experiences of the children within large groups.

The evidence that this approach might work is based upon five successful years in providing educational prescriptive teaching services to children enrolled in the Diagnostic, Counseling, and Remedial Center. Approximately one hundred reluctant learners receive these services annually.

5. Rationale

To date the general assumption has been that the major responsibility of the teacher is to assist children in obtaining the skills essential for gaining information and knowledge, a function concerned with process. To a lesser degree the teacher also is considered to have responsibility for monitoring the mental health needs of each child, a service function. In looking toward the future, however, it might be advisable to reexamine the teacher's major role and responsibilities, which almost certainly will be altered by the impact of programmed instruction and developments in classroom technology.

Present general practices in education are based upon group instruction techniques with the children functioning in a reward system founded largely on negative concepts. Traditionally, education has operated on the premise that children will learn most effectively when their performance is rated in terms of the group, the penalty for nonparticipation or minimal success being failure or group censure. Under these practices, the role of the pupil personnel services program has been to support attempts to reinforce the child's capabilities for functioning within the groups established by the system. An alternate function has been to provide psyche-repair services for those children unable to survive. Historically, pupil personnel services have provided instructional and administrative personnel with the comparative data required to establish the group criteria or norms upon which the negative reward system, fear of failure, has been established. Insight into human behavior, however, has weakened greatly the underlying premise that negative treatment can effect positive change.

If the current success being realized by the behavioral sciences in modifying behavior on the basis of positive rewards continues to be established, ultimately there must be a changing emphasis in the teacher's role. Programmed instruction, for example, is an effective method based on immediate positive reinforcement. The child sees his success rewarded immediately, and failure is defined by his own needs; that is, he perceives for himself the need to try again rather than submitting to external judgment. The focus of the instructional program is an individual thing between the child and the machine.

If academic skill development can be achieved most economically and effectively through a mechanized process, or any process based on the principles of individualized instruction and positive reinforcement, then what will be the future responsibilities for instructional and pupil personnel workers? The focus might be on a most basic need of the individual within society; i.e., humanization. The teacher and other personnel then would be concerned primarily with assisting children in their development as individuals who, having acquired an understanding and concern for others, can function in a group society.

6. A Time-Line

The following activities will be conducted during the developmental period:

a. The establishment of a planning committee composed of target area parents, public school personnel and consultant personnel from community and local colleges.

b. Define project variables and prepare research design.

c. Prepare paraprofessional training modals.

d. Develop survey instruments and computer service programs.

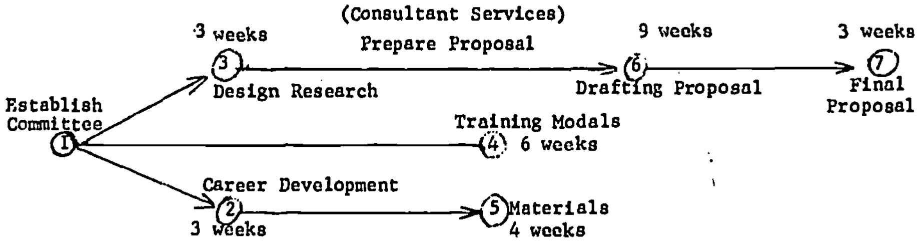
e. Select and train teachers as instructional managers.

f. Select and train paraprofessionals.

g. Select career development coordinator.

h. Select instructional materials for media center.

Time-Line



Event

1. Establish Committee
2. Develop career development concept and qualification of coordinator
3. Define variables and finalize research design
4. Prepare training modals
5. Establish listings of instructional materials for media center
6. Drafting of proposal and staff
7. Submit final proposal (15th week)

7. Budget:

a. Development

Consultant Services----------------------------------	$2,000.00
Clerical --	1,200.00
Total-------	3,200.00

Annual Incremental Costs - First Year

Direct Costs:

1. Personal service compensation	
a. Administrative	13,500.00
Career Development Coordinator-------	
b. Instructional	
Paraprofessionals-12 @4,000-------	48,000.00
c. Consultant	
6 for 4 days @$75.00 per day-------	1,800.00
Total	63,300.00
2. Travel	
7 home visitors,30 days-------------- @$5.00 per day	1,050.00
3. Supplies and Materials	
2,500 children at $10.00 per child-----	25,000.00
4. Equipment ---------------------------------	2,000.00
Total Direct Costs	91,350.00

Total Federal Funds Subject to---------$61,500.00
Indirect Costs

Indirect Cost(8% x $61,500)--------------	4,920.00
Direct Costs + Indirect Costs	96,270.00

Incremental costs would be approximately 5% annual increase of salaries from previous year -

2nd year-------------------	101,583.00
3rd year-------------------	107,162.00
4th year-------------------	113,120.00
5th year-------------------	119,276.00

b. Per Pupil Expenditures -

Average per pupil cost in ADA 1969-70-------------------------------------- 715 +

Average per pupil cost in ADA 1968-69:

Grades 1-8 ---------------	$623.37
9-12 ---------------	810.43

COMPARABILITY DATA

Indiana School District Vigo County School Corporation Grade Span of Schools Listed K-6

Mailing Address 667 Walnut Street (Street) Terre Haute (City) 47808 (Zip Code) Vigo (County) Date April 15,1971

	1	2	3	4	5*	6*	7*	8	9	10	11*	12	13*
	Number of Pupils in ADM	Average Number FTE Certified Classroom Teachers	Average Number FTE Other Certified Instructional Staff	Average Number FTE Non-Certified Instructional Staff	Ratio of Pupils to FTE Certified Classroom Teachers (Col. 1 -- Col. 2)	Ratio of Pupils to FTE Other Certified Instructional Staff (Col. 1 -- Col. 3)	Ratio of Pupils to FTE Non-Certified Instructional Staff (Col. 1 ÷ Col. 4)	Amount expended for Instructional Salaries (including longevity)	Amount expended solely for longevity	Amount expended for Instructional Salaries less longevity (Col. 8 - Col. 9)	Per pupil expense for Instructional Salaries less longevity (Col. 10 ÷ Col. 1)	Amount expended for other instructional costs	Per pupil expense for other instructional costs (Col. 12 ÷ Col. 1)
Average for Non Title I Project Schools	436.48	15.90	3.18	.81	27.45	137.25	538.86	$178,561	$46,694	$131,867	$302.12		$14.87
Title I Project Schools (List Individually)													
Central - South	246.93	10.	2.09	1.	24.69	118.15	246.93	$104,121	$25,267	$78,854	$319.34		$14.87
Dresser	65.1	3.5	.95	1.	18.60	68.53	65.1	34,609	5,943	28,666	440.34		14.87
North	347.4	12.	2.75	1.	28.95	126.33	347.4	131,081	34,737	96,344	277.33		14.87

*Criteria upon which the SEA shall base its determination of compliance with the comparability requirement.

SIGNATURE OF AUTHORIZED REPRESENTATIVE

8. Evaluation

The primary services will be concerned with the problems of individuals; therefore, the evaluation will be concerned with the services provided individuals and their effectiveness.

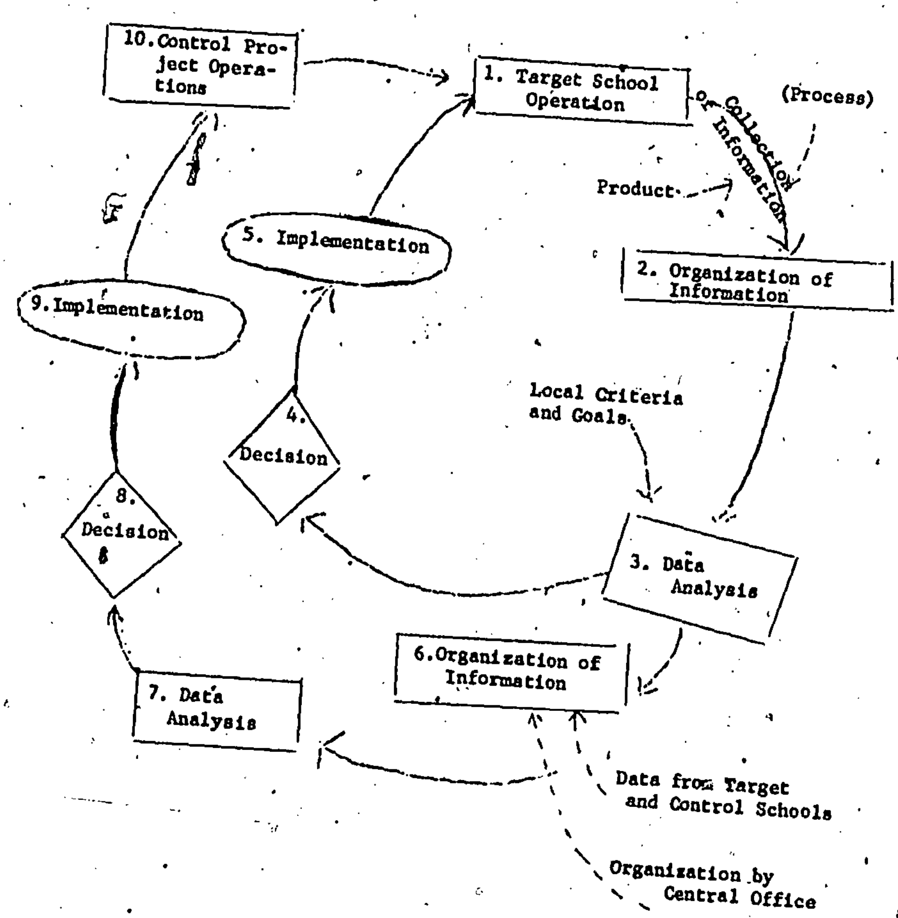
There are many techniques and devices for such evaluation but the choice of a particular technique or device will still depend upon factors such as the objective of the service, availability of measuring instruments and the sophistication of persons using the technique. With the individual, the primary technique will be case studies. The collection of data will be facilitated by psychological reports, records of test results, pupil, parent and teacher monitoring devices.

GENERAL CATEGORIES OF OBJECTIVES	POSSIBLE EVALUATION METHODS OR DEVICES
Cognitive Domain Knowledge of subject matter, problem solving, skills in application of concepts acquired, memorization of facts, achievement in reading comprehension, skills in numbers, language, and other academic areas	a. Use of standardized tests: Achievement tests of all types, reading tests, readiness tests, rating scales, checklists, intelligence and aptitude tests, general ability tests b. Teacher-made tests: Objective tests of all types, performance tests, essay tests using recall, relationships, and application of facts
Affective Domain Attitudes, motivations, interests, adjustments, anxieties, and ideals	Various observation techniques, questionnaires, rating scales, dropout counts, record of parent involvement, case studies, interviews, role playing, interactional analysis.
Social Development Acceptance, recognition, belonging, leadership, interaction	Observation techniques, role playing, interview, classroom observation, interaction analysis, pictorial and verbal projective techniques, and anecdotal records
Physical Development General health and ability, speech, hearing, vision, motor skills and dexterity	Health and physical fitness tests, medical evaluations, vision screening (Keystone Telebinocular) audiometric evaluation, Frostig visual-motor skills, Bender Gestalt, and observations

9. Statement of Compliance:

The applicant will comply with Title VI of the Civil Rights Act of 1964 (P. L. 88-352) and all requirements imposed by or pursuant to the Regulation of the Department of Health, Education, and Welfare (45 CFR Part 80) issued pursuant to the title, to the end that no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the applicant receives Federal financial assistance from the Department. (The assurance of compliance - HEW Form 441-- or court order, or desegregation plan previously filed with the U.S. Office of Education in accordance with the Department of Health, Education, and Welfare Regulation applies to this application).

A FEEDBACK CONTROL LOOP



SCHOOL CITY OF GARY,
Gary, Ind., May 12, 1971.

THE EXPERIMENTAL SCHOOLS PROGRAM,
U.S. Office of Education,
Washington, D.C.

GENTLEMEN: The School City of Gary, Indiana, and Public Management Corporation hereby express their interest in jointly planning an Experimental Schools program for five thousand underachieving children from low-income families in our city. The project we propose reforms the learning experiences currently offered to students in Gary, replaces the classical school system organizational structure and revises the relationship between our educational establishment and the community. Because it entails a broad shift in the interactions of underlying political, economic, social and educational forces that determine the quality of life here, we refer to our project as the New Gary program.

APPLICANT AGENCY

The School City of Gary is a local education agency governed by a five-man Board of School Trustees appointed by the mayor. Approximately 47,000 students—33,000 elementary and 12,000 secondary—attend 45 schools in the district. Annual expenditures in fiscal 1970 were $38 million, supplemented by approximately $1.3 million from the Elementary and Secondary Education Act of 1965.

The district is administered by a superintendent of schools, who is now called president of the School City of Gary; an associate superintendent for curriculum and instruction, called executive vice president; and three assistant superintendents, called vice presidents. There are currently twenty supervisors, whose responsibilities lie in subject matter, grade level and special problem domains. Approximately 2200 teachers, 175 administrators, and 300 paraprofessionals carry on the instructional program. Non-academic services are organized in specialized departments, such as food services administration, maintenance, and accounting. Approximately 900 employees work in these fields.

Our system no longer serves the needs of the present population of Gary and perpetuates underachievement, poverty and despair. The present Board of School Trustees and administration are unified and have dedicated themselves to total reorganization of the Gary public schools. They are not divided by many internal arguments that have hindered innovation in other urban settings. We confidently expect that a radical program to change Gary's school system will not falter for lack of board or administration commitment; and we have secured pledges from many other crucial actors on our educational scene—staff, community, and business—to participate in the preparation of our proposal during the planning grant period.

As evidence of our willingness and desire to change our system, we submit that School City has already participated in two of education's most sweeping innovations: the Banneker Contracted Curriculum Center, in which an entire elementary school has been contracted to a private firm, and a preliminary feasibility study of the Office of Economic Opportunity's proposed educational voucher plan. In other, perhaps less controversial programs, evaluations have reported significant improvement in the academic achievement of the 25% of Gary's four-year-olds who attend our Concentrated Pre-school Program; the rising verbal facility of students participating in our bilingual skills program has been termed "very significant" by evaluators of this Title VII project; and all Gary's high schools employ the techniques of CORE curriculum and independent study, with special emphasis on remedial work for non-achieving students. We have learned from these experiments and believe that the Experimental Schools program that we wish to plan will benefit from both our experience and our mistakes.

Despite the availability of competent in-house personnel and outside consultants, the Board of School Trustees has only recently found itself in the appropriate political setting to research and implement a more comprehensive program that has the possibility of altering the educational experience of every child who enters our system. We have tinkered, but we have not yet had the funds to discard many learning strategies, organization structures and community relationships established when Judge Gary founded our city 67 years ago. We believe that we are limited by our insider's viewpoint. In the past we have used ideas from sources outside the conventional education establishment that some school boards could not feasibly consider, from private profit-making firms

to militant community groups. In this program we wish to draw on the resources of the Public Management Corporation, an organization specifically formed to plan and implement the New Gary program.

The Public Management Corporation (PMC) is composed of business managers, educators, researchers, students, community leaders and diverse academic professionals. Its organizational objective is to demonstrate significant alternatives to conventional school programs, after analyzing local processes that currently determine outcomes. PMC's staff is qualified by education, training and experience to fuse into our project advantages that we, as educators, would find it difficult to generate alone. School City, PMC, and Office of Education personnel would form a management team in the New Gary project.

Problems to be solved

School City's most pressing problem is underachievement in the basic skills. The long-range effects of these early deficiencies on subsequent educational achievements has been well documented in Gary and elsewhere. Lack of facility in language arts and mathematics also damages pupils' self-image, parental support for and involvement in the schools, public willingness to finance education, community participation in the socio-political process, and future employment opportunities. Therefore, basic skills emphasis has assumed first priority status here.

Second, Gary, like many other urban areas, has racial problems that are affected by education. Our city is 55% black and 9% brown. Residential patterns and relationships among racial groups have deteriorated. We attribute this function as much to inadequate education and involvement in the educational process as to deep-seated attitudes. Diverse elements in the Gary community from United States Steel to the Black Panthers support this view.

A third problem is underdevelopment of staff resources. Like many teachers across the nation, ours are sometimes poorly trained and motivated. Their attitudes toward underachieving children leave a good deal to be desired. When children fail, teachers fail, too, and both student and teacher attitudes become further depressed. Partially as a result, a counter-productive adversary relationship between our board and our union, AFT Local Number 4, has to some extent obstructed change. The New Gary program would improve this relationship by giving our union and school staffs a primary role in the planning, implementation, control and evaluation of the experiment.

Our fourth problem is the lack of unified goal-setting and communication among components of our school system. Only infrequently do individuals responsible for self-contained units of the system meet on common ground. For example, our high school teachers often know very little about processes in the elementary school that govern academic readiness of their prospective students; and our elementary school teachers often know little of what their pupils will encounter when they move to the complexities of the junior high school. Thus, a child who enters the educational arena at age four is passed through a series of hands that rarely touch each other. Frequently, neither he nor many of those who govern his educational progress know where he is going and why.

Our fifth problem is resource allocation. Like all school districts, most of our expenditures go for teachers' salaries. That leaves us little flexibility. We are also strapped by state, union, and administrative regulations that keep us from doing what we know we should do. It is not so much that we want more money—although more would help; it is that we wish to be freer to spend the money that we have in ways that we know are more productive. In particular, we, like other school districts, must find a way to provide our children with quality education in the face of mounting costs that make it necessary for us to reduce the number of teachers that we can afford to employ.

We believe that the New Gary model will enable us to reallocate resources and produce improved educational results without raising our costs beyond the increases caused by inflation.

Target population

The target population of the New Gary Experimental Schools program is approximately 5,000 students, ranging from kindergarten to twelfth grade. At present these students attend one pre-school, four elementary schools, one junior high school, and one high school. The students are 90% black and 10% brown. The average income level of families in the area is $3,000 per year. They live in downtown Gary neighborhoods torn by the 1968 riots. Their houses are old, overcrowded, structures that the occupants can neither leave nor improve.

By contrast, the average income level of the entire Gary community is $10,000 per family per year. The city is 55% black, 9% brown and 36% white. Many of its 180,000 occupants depend on the fortunes of giant steel mills along the southern shore of Lake Michigan. Very clear distinctions among residential patterns and quality of housing exist, although the general industrial character of the area gives the while city a "grimy" appearance.

A primary characteristic of the target population is its racial isolation and restricted upward mobility. One study showed that 74% of children who were born and go to school in this community remain there. In contrast, only 40% of the total Gary population remains within the locale of their birth or education, tending to migrate to the suburbs or less congested areas of the city.

Among the target population, the educational problems referred to above are particularly acute. These 5,000 children are destined to fail. Their average reading and mathematics achievement scores at the end of the sixth grades are at the 4.3 grade level. In junior high school most of them require remedial attention and form the nucleus of a low-achieving group. Only 27% of them develop expectations of attending college, as compared with 53% in the rest of the city. They, their parents, community groups in their areas, and local business and industry regard their neighborhood as a blighted ghetto. However dedicated, school staffs think of their jobs as somewhat less desirable assignments than those in other parts of the city; consequently, the level of staff morale is lower and the level of union agitation higher than elsewhere.

The target population represents one-ninth of our total school population. Although it is the most severely disadvantaged, it is not the only disadvantaged community in Gary. For this reason, progress made in the New Gary program could be appropriately translated to at least four roughly homologous populations within Gary itself.

Description of the project

Constraints.—The target population has native ability at least equal to that of the general population in Gary. Therefore, students who participate in this program should perform on a scale at least equal to the average achievement of all students in the School City of Gary, not only in basic skills areas, as measured by objective tests, but also in the higher skills areas measured by such instruments as the National Merit Scholarship Test and the tests of the College Entrance Examination Board. We intend to develop new methods of measurement for both academic and non-academic achievement, but our disadvantaged children must also succeed by standards applied to advantaged children.

Children who participate in this program should come to view themselves and be viewed as successful learners and worthwhile individuals, proud of their native abilities and their racial heritages. Staff skills within the School City must become capable of overcoming existing and newly-discovered deficiencies. School staffs will be expected to set for themselves goals of both student achievement and personal development. At the heart of these tasks will be a major thrust toward full accountability.

The New Gary program must also create a set of operational circumstances in which components of the educational process—students, parents, political leaders, business and industry, union, staff at all academic levels, the Indiana Department of Education and others—enter a dynamic system that becomes flexible for constant renewal and change. In particular, all elements of the community must play an active role in the planning, development, implementation and evaluation of the project.

Finally, with the exception of incremental amounts temporarily provided by the Office of Education to plan, develop and evaluate components of this project, the program must be responsible within our normal operating and capital expenditures. Only the reallocation of resources will enable us to meet this objective.

Goals of the Project:

The broad goals of the New Gary program are:

To establish for the present K–12 target population a totally individualized learning continuum through which students are motivated to move voluntarily and maximize their perceptions of academic success, future expectations and control over their destinies.

To develop an instructional management system—including materials; community, learner and staff behaviors; technique reservoirs; flexible resource allocations; effective feed-back mechanisms and methods of self evaluation—that

may be perpetuated by internal School City personnel and the Gary community.

To design a functional, continuous personal and professional development program for all staff actors in the system, including paraprofessionals, supervisors, administrators and non-academic employees, that results in effective instructional management of the educational process and reasonable fulfillment of the management team's own aspirations and desires.

To plan, develop, implement and evaluate the program with such complete involvement of the general community, including parents, political leaders, business and industry, unions, the media, and other leadership groups that the eventual outcome is regarded as the product of a total city effort and is consequently accepted by a majority of the crucial local community elements.

To conduct the New Gary program by means of an organizational structure separate from the normal operation of the School City of Gary so that the program is economically and educationallly accountable for results in unequivocal terms and so that it may utilize techniques, methods and attitudes not ordinarily available to the conventional school system.

The Project and the Community:

In the sense of this letter, when we use the term "community" we mean not only the parents and neighbors in the target population but also other forces and factors that tend to determine education for the target population. Unless these other forces participate in the development of the New Gary program, they will accidentally or deliberately cause it to be watered down or fail. Representatives of the target community will have majority representation on the governing body of the New Gary program, but there will be involvement of conventionally determinant groups as well: the union, the Chamber of Commerce, important local industries such as steel, and all other elements that affect outcome.

The New Gary program will have its roots in the local target community. Parents and neighbors will have both elective and appointed representatives during the planning period itself. A grass roots feasibility study will be part of the planning period. Part of the management task of the program will be to develop the community's understanding of its basic role: to develop goals and policies and to evaluate the implementation of these goals and policies by the persons to whom they have delegated the operational responsibility.

We anticipate that some parents within the target population will later serve in the schools as paraprofessionals; and our experience has been that these individuals play a vital role both in the instructional management system and as avenues of information exchange within the community. In addition, it will be part of the program to develop the career potentialities of these community assistants. Part of our program would provide continuing educational opportunities for other adults in the target community.

We wish to restore the schools to a central place in community development. Because of distrust of conventional schoolmen's attitudes by frustrated parents, this place has been questionable in recent years. Participation in planning the proposal will help to overcome this weakness. Furthermore, the "community education" concept that we will subsequently describe will provide incentives for broad participation and a sense of pride.

In this program, parents of children in the target community will be the primary evaluators. Although evaluation will also be conducted by internal professionals and by the Office of Education, the Board of School Trustees' primary responsibility is to these parents, at least so far as their own children are concerned. During the planning period, definite feed-back mechanisms will be established to determine their responses. During the development phase that precedes the opening of the program, simulations of the operational phase will be performed to test the viability of these mechanisms. Training will be provided so that the community may become more sophisticated in its participatory and evaluative techniques. During the operational phase, these techniques will be employed, leadership roles and responsibilities will be continually redefined, and new means of participation will be devised on the basis of our new discoveries.

We intend to maintain some of the desirable styles of community involvement already in effect here: meetings, publications, communications through the media, volunteer work, and so forth. The operational phase of the program will include a component of vocational training for members of the community who have already left school. We will also attempt to train the non-target community to interact with the target community in ways that are more likely to produce satisfactory results and genuine, human respect.

Operational Variables of the Project.—The Experimental Schools program that we would like to plan is primarily a Management Systems Community Based model. The concept rests on a managerial delegation of authority combined with a mobilization of community skills for the purpose of achieving equality in basic and higher education, affirmative inter-racial attitudes, effective staff development and accountability, unity of purpose within the educational system and a reallocation of resources.

Organization and Administration

Subject to alterations during the planning grant period, including consultation with the Indiana Department of Education, the School City of Gary will temporarily delegate the authority to supervise the educational process within the target community to a separate entity, Public Management Corporation.

Although this delegation is based on concepts of accountability and performance evaluation, it is not a performance contract. Instead, it is a mechanism to create an alternative system, one that is not dependent on the existing system, policies, procedures, objectives, techniques and physical plant.

Public Management Corporation will establish a Board of Directors of the New Gary program. The board will be composed of three members of the Board of School Trustees, the president of the School City of Gary, the president of the Public Management Corporation, one representative of AFT Local Number 4, one representative of city government and one representative of each other group considered essential by members of the proposal planning team. In addition, the target community will be represented by a number of directors equal to the number of individuals already named plus one; in other words, it will have a majority of votes.

A general manager of the New Gary program will be chosen by the board of directors. Optimally, he will be in both education and management and will be the chief operating officer of the project. He and the board of directors will determine further organization structure, under the constraint that it lends itself to accountable managerial, rather than administrative behavior, and reinforces the other operational variables of the program.

In a Management Systems Community Based model, the concept of administration will be related to staff functions. Line officials will be seen as managers, not administrators. The line officials include the general manager, executive vice president for instructional management and building officers—who might be called center managers. Officers in charge of research and development, program planning, community education and finance will be seen as staff men. Many traditional staff functions will be eliminated; for example, there will be no language supervisors, though there will probably be a staff specialist, consultant or trainer in the management of language instruction.

The executive vice president for instructional management will be responsible for overall implementation. The vice president for program planning—who might be called vice president for accountability—will be responsible for the methodology of needs assessment, change strategies, cost effectiveness, and program audit. The vice president for research and development will be responsible for planning staff development, technical assistance, program monitoring, and evaluation. The vice president for finance will supervise performance budgeting and accounting and consult on the financial implications of program planning and design. The vice president for community education will direct the extramural program described below. The line official in charge of each physical structure will be accountable microcosmically for similar functions. His immediate subordinate, who will be called learning director, will have primary responsibility for supervision of the instructional system including personnel within that physical structure. The learning director will have no "administrative" responsibilities. Non-academic tasks customarily performed by a building principal will be performed by the center manager, who will be a licensed principal.

Time and Space

The New Gary program contemplates the assignment of students to building units or "centers" according to residence, not grade or age level. In fact, grade levels will be abolished. Students ranging in age from 4 to 18 will be assigned to the same center. Since they will progress through the curriculum continuum at their natural rates and will conduct part of their educational activities outside the school building, they will interact with each other in the more informal

manner that prevails outside the school in the community at large. For example, older students will be helped to accept specific objectives; and members of the adult instructional management team will be expected to develop instructional management capabilities among older students.

Our experience in the Banneker Contracted Curriculum Center has taught us that even the youngest students are capable of structured self-direction, although they require more help. The New Gary program will attempt to foster freedom, in contrast to the customary repression, among these students. Even precautions taken to assure physical health and safety will be conducted in this spirit. The affective direction will be toward self-discipline rather than authoritarian control.

For students at higher age levels, progress will also be in terms of the achievement of learning objectives, not attendance. Older students will have the option of selecting the times of the school year that they will attend classes, seminars or tutorial sessions. Formal classrooms as such will be eliminated and resource centers, study carrels, learning laboratories and the like will take their place. Activities which can only be performed in specialized locations or with equipment—such as physical education, driver training, or chemistry—will be performed in centers to which all students will go. In this way, a duplication of facilities will be avoided and the self-directing character of the learning experience will be enhanced.

Facilities will be open from 7 a.m. to 9 p.m. weekdays and from 9 a.m. to 5 p.m. Saturdays and Sundays. The calendar year will be organized in four quarters, each containing a ten-week term and a three week vacation or extramural community education period.

Specific locations within the larger Gary community where academic, vocational, or enrichment experiences can meaningfully take place will be opened to students for the pursuance of their learning objectives. During the planning period, the specific character of these community education centers will be defined; and during the development phase centers will be identified. Community contributors of time, effort and facilities—U.S. Steel, the mayor's office or the corner grocer's—will be eligible to receive compensation for their contributions. A catalogue of community education centers will be compiled and circulated to the instructional management team. These centers will be part of the "campus" of the New Gary program and will be regarded as central sites of the learning experience.

Role and Organization of Staff

The professional and paraprofessional instructional staffs in the New Gary program will be managers of the learning process. Since their traditional roles will be changed, they will be asked to volunteer to participate in this project. It is contemplated that the professional teaching staff will be reduced by ⅓ and that the paraprofessional force will be doubled. Pupil-teacher ratio is not considered a valid index in this program: pupil-adult ratio is. Permission to employ this variable of the experiment will be sought from the state and negotiated with the union. In view of our potential need to lay off teachers because of deficits in the School City budget, this variable is both realistic and necessary to the experiment.

No merit pay is contemplated, but staff performance criteria will be written in terms of learner behavior. Each instructional manager will be a member of a multidisciplinary instructional management team. Besides professional teachers, each team, which may be called a "task force," will have technical assistants, instructional assistants, research assistants, clerical assistants and other support personnel.

A multi-level group of learners will be assigned to each instructional management team. The teams will direct themselves to learner behavior throughout the age spectrum. In this program we regard the notion of age-related specialties, such as early childhood, elementary, secondary, etc., as dysfunctional. The curriculum will be organized as learning continua; and only broad time parameters will be set for the achievement of particular learning objectives. Members of each team will be assisted to understand the inter-relationships of objectives that are likely to be achieved at different ages.

During the development phase of the program, each instructional management team, with the aid of curriculum and management consultants, will be expected to develop a plan to facilitate pupil movement through the learning continuum,

to organize instructional materials and learning activities into curriculum management guides, to devise a management information system that optimizes the allocation of resources to individual learners, and to prescribe a comprehensive, on-going team training program that stabilizes learning center performance through an organized application of instructional management techniques.

During the operational phase of the project the team, in consultation with specialists, will be responsible for the diagnosis, prescription, facilitation, monitoring, and evaluation necessary to achieve desired learner behaviors for each student who is assigned to that particular team.

Members of the non-educational community, including parents and local businessmen, will participate in the activities of the instructional management team. Since the community education premise of the New Gary program is that important learning experiences take place outside the school building, it will be incumbent on the teams to discover and mobilize these extramural resources for the benefit of the students and themselves.

It is necessary to emphasize both the control and freedom of the instructional management team. During the development period it will have the option of selecting or making materials, reforming itself, and standardizing the learning strategies that it chooses to employ for the achievement of agreed upon student behaviors. The School City's experience in the Banneker program indicates that such autonomy is both feasible and desirable. When the implementers decide, they are far more likely to view themselves as accountable for the results. Furthermore, the very tasks of the implementers form the base of a coherent, self-generated continuous staff development program.

Curriculum

We believe that in a community based instructional management system like the one that we wish to design during the planning period, the term "curriculum" becomes obsolete because of its convenient association with mandated subject matter and instructional materials. We want our target population to achieve competence in basic skills and the ability to work effectively and perform creatively in advanced disciplines. However, major emphasis in the New Gary program will be on techniques of learning and styles of learning experiences, rather than the acquisition of knowledge. We regard the "basic skills" themselves as such techniques when the learning process is one of individual, self-directed inquiry. The higher skills also fall into this classification when approached by the means of appropriate individualized strategies and evaluative techniques.

The wide variety of multi-media, individualized instructional materials on the market will remain available to the students and adults in the New Gary program. However, we consider it essential that those who participate in the program during the planning and development periods and who determine learning objectives be responsible for selecting these materials or making their own. With guidance, they also assume the responsibility for developing the curriculum management guides that will enable them to use these materials in a flexible, self-directive way for each student. These guides will make it possible for instructional personnel to prepare written prescriptions for the learner in consultation with the learner himself and to keep him progressing on an individual basis without falling into the rut prescribed by some textbook. (We expect that conventional textbooks will be used only as reference materials and that even the youngest learner will soon develop the capability to work with a wide variety of instructional resources.)

Finally, we believe that students in the program will have achieved the conventional curricular objectives earlier than their counterparts in the regular school system. Therefore, we intend to incorporate within the higher levels of the design a series of academic experiences that will ordinarily be encountered in college. By means of community-based, technical and vocational instruction, extramural apprenticeship experiences, and other activities, we intend to provide a program of transition to adult responsibility for both college-bound and non-college-bound youth.

A significant alternative

The basic components of the New Gary progra mare a performance-oriented organizational structure; a managerial, as opposed to administrative, approach; a full year full week multi-age level, community-based utilization of time and

space; a self-developing instructional management team; and a heuristic, multi-disciplinary, life oriented "curriculum."

These variables make up a system. We understand the system as a means of generating life styles and programs for personal development. Given today's world a member of our target population should always be a student, even after he "graduates." He should see that his "teachers" are also learning; that his parents and other members of the community are learning; and that learning is not personally defeating or highly aversive. Our experiences, and the experience of others with elements of the system such as individually prescribed instruction, programmed materials and elementary school instructional management lead us to believe that a comprehensive program using these elements and others will succeed.

Our present school system is bound up by rules and regulations that have been with us for decades and, in some cases, a hundred years. The alternative system that we propose here requires that the School City, the State of Indiana, and AFT Local Number 4 temporarily suspend some judgments they have previously passed. Preliminary conversations lead us to believe that, if involved in the planning of this program, they will. Our Banneker and voucher plan experiences have made clear that securing agreement will not be easy. The single, most consistent cause of failure of educational experiments is the attempt by establishment groups to achieve bold objectives without making changes in their own behavior. Ambitious as it is, the Office of Education's Experimental Schools program will also fail unless its directors are willing to think the unthinkable. This is it. We are prepared to suspend the concept of pupil-teacher ratio, the notion of classroom teacher, the role of school administrator, the conventional organization of pupils and staff, and a number of other shibboleths. We will offer trade-offs to all interested groups; and we believe that these trade-offs will be accepted.

Activities for development

Assuming the aggregation of interest groups during the initial planning grant, the following table shows activities proposed for the intial development period of the New Gary program:

1. Formation of board of directors.
2. Selection of general manager and top executives.
3. Identification of prospective staff and community resources.
4. Selection of evaluation teams.
5. Evaluation activities begin.
6. Planning and information sessions for staff and community.
7. Beginning of staff training and development activities.
8. Formation of instructional management teams.
9. Program planning and budgeting system activities begin.
10. Meetings and goal setting activities of instructional management teams; selection of materials, role identification, etc. begins.
11. Development of curriculum management guides begins.
12. Identification of student clusters and temporary assignment to instructional management teams.
13. Completion of preliminary instructional objectives.
14. First evaluation of development process.
15. Student needs assessment begins.
16. Establishment of community-based curricular activities and learning centers begins.
17. Finalized plans for Year One.
18. Year One begins.

Budget and request for incremental support

Per pupil expenditures in the School City of Gary during fiscal 1970 were about \$800. For fiscal 1971 they were \$850. We project an annual increase of from 7 to 10% each year for the next five years. In addition, approximately \$50 from federal sources were spent on each child in the target population. These operational costs will continue to be spent in the New Gary program.

The following incremental funds are requested from the Office of Education's Experimental School program:

	Development period	Year 1	Year 2	Year 3	Year 4	Year 5
Personnel training and development	$550,000	$700,000	$500,000	$400,000	$300,000	$200,000
Community education centers	200,000	200,000	150,000	100,000	50,000	25,000
Development of instructional aids and systems	200,000	100,000	50,000	50,000	25,000	25,000
Minor remodeling	50,000	100,000				
Evaluation and documentation	100,000	100,000	100,000	100,000	100,000	100,000
Total	1,100,000	1,200,000	800,000	650,000	475,000	350,000

Evaluation and documentation

Internally, the vice president for research and development of the New Gary project will be responsible for evaluation and documentation. Although some documentation will be performed by the project staff, it is contemplated that a contract will be made with an independent evaluator to assure objectivity and accountability. Besides pre and post test measurements on standardized instruments, subjective measures will be used to determine the outcomes of the project among students, staff, and the community.

The independent evaluator will be expected to present a design acceptable to both School City and the Office of Education. It should provide checkpoints at least three times in each school year, probably in December, April, and July. At these times, the management of the New Gary program will take steps to alter its course in an effort to reach its specific goals and objectives.

Part of the incremental funding provided for evaluation will be used to develop new measures of learning behavior to correct the inadequacies of conventional standardized tests. We, like others, have reservations about these instruments' relevance for inner-city children and their accuracy in measuring achievement. We consider this Experimental Schools program a favorable opportunity to develop new measurement devices.

Civil rights compliance

The School City of Gary and Public Management Corporation are in full compliance with the provisions of Title VI of the Civil Rights Act of 1964.

Very truly yours,

SCHOOL CITY OF GARY,
GORDON L. MCANDREW, *President.*
PUBLIC MANAGEMENT CORPORATION,
GEORGE H. STREN, *President.*

Mr. BRADEMAS. The Chair expresses its appreciation to those who have cooperated in our hearing here today.

From this point, we plan to visit the Metro School, the so-called school without walls later this afternoon.

The hearings are now adjourned.

(Whereupon, at 12:05 p.m., the subcommittee was adjourned, subject to call of the Chair.)

(The following material was submitted for the record:)

PROBLEMS OF PLURALISM AND POLITICS IN EDUCATIONAL RESEARCH AND DEVELOPMENT: COMMENTS ON THE PRELIMINARY PLAN FOR THE NATIONAL INSTITUTE OF EDUCATION [1]

(By Samuel Messick, Educational Testing Service)

The preliminary plan for the proposed National Institute of Education (Levien, 1971) offers a stimulating conception of what an NIE might come to be. The plan outlines a challenging initial program for the Institute whereby it would attempt to move ahead on four fronts simultaneously and would develop and maintain a workable balance between short-term and long-term concerns. That is, by

[1] These comments were delivered as part of a Symposium on "Perspectives on Recent Research," at the American Educational Research Association meetings in New York City, February 1971. I gratefully acknowledge the many stimulating contributions of Melvin Tumin to my thinking on this topic.

the proposed plan the Institute would not only directly attack the urgent and recurrent educational problems of the times, but would also sponsor research-and-development activities to advance educational practice, would facilitate the formation of a strong R & D system having effective links between research-and-development, manpower training, and field application, and would also engage in and support basic research on the scientific foundations of education. This combination of action research-and-development on the one hand with basic inquiry on the other is seen as being absolutely essential for the accomplishment of short-range impact and long-range viability.

The plan also proposes an insightful organizational structure for the Institute that recognizes that basic research and large-scale development activities require different modes of specification, staffing, and management; it wisely institutionalizes these differences into separate Directorates and Divisions. Such a structure should not only facilitate the operation of different administrative styles for the different missions, but should also tend to preserve the integrity of each component from a natural tendency to assimilate one to the other. In particular, this structural separation may serve the important function of protecting basis research from continual threats to divert it and its resources wholly into action research on immediate pressing problems. This structure also entails some potential weaknesses, however, for basic research thinking and personnel should not just be protectively nurtured—they should be insistently implicated as well in the planning, conduct, and evaluation of action and development programs. This dual requirement of both involvement and independence creates inevitable tensions and conflicts, with attendant problems of coordination and communication. However, the proposed solution of the NIE planners promises to be reasonably effective on this score—namely, the utilization overall of a matrix organization in which staff members of one Directorate or Division would be expected to work part of their time on project teams of other Directorates or Division.

It seems clear at this point (and it is repeatedly underscored in the planning document) that such an ambitious program cannot be successfully mounted without a staff having both continuity and competence. Accordingly, the preliminary plan and the pending Congressional legislation include several provisions that should both increase the likelihood of continuity in the face of changing political pressures and make it easier to recruit and retain high-level personnel. Implicit in the entire enterprise of a National Institute, however, is the notion that we must try something new and perceptibly different, as opposed, for example, to shoring up the present research machinery within the Office of Education by increasing *its* continuity and competence.

The need for a new beginning for educational research-and-development on the national scene has been drawn pointedly and bluntly by Gallagher (1970), and the reasons he puts forth should be examined carefully by the architects of the new Institute so that the old pitfalls may be avoided. His basic point is that there has developed over the years such a profound lack of confidence in the ability of the existing OE research organization to administer effectively any new programs or expanded resources that we simply must start anew. This erosion of confidence on the part of Congress and of the educational community broadly is traced to an unfortunate conflict of pressures. In responding to these pressures, the Office of Education succeeded in offending two major bodies of critics—one, the scholarly community, especially behavioral and social scientists, who decried their lack of involvement in both the planning and execution of OE research programs and were quick to criticize them for their consequent lack of rigor; the other, a variety of user interests in education who felt that the OE Research and Development Program was too influenced by researchers as opposed to practitioners and consequently was not practical enough or sufficiently productive of noticeable differences in the schools.

Thus, the Office of Education research program was caught between the pressures of conflicting interests, and it faltered. But those conflicting pressures are real and still operating, and it is a gross oversimplification to view them as a single polarity between research and user interests. There are a multiplicity of interests in the educational arena stemming primarily from an underlying pluralism of values. These interests in turn produce multiple and sometimes conflicting objectives that education must simultaneously serve. Why should we expect a National Institute to fare any better than the Office of Education in

dealing with these pressures? The answer is, "We shouldn't!"—unless we recognize the source and power of these pressures and incorporate within the plans for the National Institute adequate provision for the continuous monitoring and resolution of these forces. The basic problem is that multiple and competing demands arising from a pluralism of values are, in a pluralistic society, *all* legitimate candidates for the attention and resources of a National Institute. Given limited resources, however, the National Institute will be forced to establish *priorities* to deal with multiple demands and *policy* to deal with conflicting ones. The critical point here is that, since all of these demands are legitimate, the priorities and policies must be repeatedly examined and their consequences continuously evaluated in a sufficient participatory fashion that we avoid crystallizing different constituencies into hostile camps and we keep the pluralistic dialogue open. This is no mean feat, to be sure, but it must be attempted, for these multiple pressures are not only social realities but political realities and a National Institute of Education will be highly visible politically.

One mechanism for openly confronting these divergent viewpoints is already built into the proposed structure of the Institute—and that is a heavy reliance upon representative advisory groups at all levels of policy planning and program functioning. But the issue is so critical that in addition it should be given a major focus at the highest level by incorporating this concern as one of the Institute's prime objectives. That is, one of the major purposes of the National Institute of Education should be to undertake a continuing reexamination and clarification of the social goals of American education and attempt to illuminate the relationship between these goals and underlying social values. Such intensive examination is urgently required if we are to penetrate the rhetoric of current goal statements in order to formulate workable procedures for goal attainment. Take, for example, a goal as universally endorsed as "equality of educational opportunity." What does that mean? Does it mean developing an educational system that will produce equality of outcome or condition? Or, if we grant that individual differences in condition will likely always exist, does it mean developing an educational system that will at least not perpetuate existing inequities?—for example, by producing levels of outcome that are not correlated with prior conditions such as parents' socioeconomic status or with invidious distinctions such as race or sex.

Incidentally, some observers may hope that a National Institute of Education would avoid much of this controversy by maintaining a low profile politically—say, at least at the level of the National Institutes of Health. There would appear to be little hope for this, however, primarily because the pluralistic nature of educational goals will inevitably keep the Institute's efforts constantly in the political limelight. There is very little pluralism with respect to national health goals—about the desirability of mental health or of a cure for cancer. Whatever controversy there is revolves about means and resources, rarely about ends. And concern about ends is the heart of the political process. But this political centrality of a National Institute of Education is not all liability. The Institute will be politically vulnerable, to be sure, but the same spotlight that heightens influenceability may produce as well a substantial influence in its own right for the shaping of national priorities, particularly if the Institute is successful in pursuing long-range goals that embody our aspirations as opposed to short-range goals of solely political appeal. To do this will require a delicate balance of responsiveness and perseverance. The National Institute will *have* to respond to political firebells when they ring, for it will be on the firing line with respect to Congressional concerns about education. But it must *not* react to every political cowbell that rights, for a slavish responsiveness to changing political winds would introduce its own kind of insidious discontinuity.

If it is to be truly effective, there is yet another kind of pluralism the National Institute must be sensitive to—and that is a pluralism of theory and methodology, of conception and approach, in the independent research community and academia. Since the bulk of the National Institute's programs will be carried out by external agencies, it makes a big difference how these agencies are implicated in the process. It is anticipated that basic research activities will be largely specified by the scientist who is to perform them with little detailed guidance from the funding agency, but that large-scale development activities will be specified by groups representative of the eventual users as well as the developer and carried out under much closer scrutiny by the funding agency. Thus, much of the research-and-development activity will be of a type that has come to be called "targeted or directed R. & D." The question here is, "How directed will it be?" Although it is imperative that the NIE staff participate

actively in the process of formulating problems and approaches to their solution rather than merely responding to proposals from the educational and R. & D. communities, it is likewise imperative that the educational research community not be relegated solely to the role of purveyor of services in response to rigidly specified requests for proposals. The NIE must seek a middle ground with a research and development program that is "targeted" in its delineation of problem areas but not so "directed" that it hamstrings prospective contractors in their development of innovative and adaptive approaches to the problems. In this way the National Institute would serve not only to support important independent research but also to invigorate and extend the research community, capitalizing upon its pluralism in theory and methodology to maximize the impact of research and development in American education.

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DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE,
PUBLIC HEALTH SERVICE,
HEALTH SERVICES AND MENTAL HEALTH ADMINISTRATION,

August 12, 1971.

Hon. JOHN BRADEMAS,
U.S. House of Representatives, Chairman, House Subcommittee on Education, Washington, D.C.

DEAR MR. BRADEMAS: At the NIE planning conference in Berkeley, July 1, 2 & 3, you asked that I put some of my thoughts regarding an NIE on paper for your perusal. The attached statement has been delayed because of my move from California to the D.C. area.

I appreciate the opportunity to briefly convey these ideas to you. Presently I am expecting to work part-time with the NIE planning group, and I will hope to have a chance to discuss some of this further with you or your subcommittee. This communication indicates my views and not necessarily those of NIMH or the Mental Health Study Center.

Sincerely yours,

SPENCER A. WARD, M.D.

REGARDING PLANS FOR A NATIONAL INSTITUTE OF EDUCATION

In introduction, I am a psychiatrist working with the National Institute of Mental Health. My practice and research have been focused on the areas of school consultation, group therapy and family therapy. Out of this experience, I have come to a clearer awareness of the impact that schools have on the personality development of children. Currently, I am completing my work for the Ph. D. in Education at the University of California.

I was excited with the ideas and plans you outlined in your comments of Friday afternoon, particularly with the work you and your subcommittee are doing. I was impressed also with your statements that very few congressmen are interested in Education R&D; and that few congressmen know what Education R&D is or see any evidence that work in the area has produced useful results. It appears to me that much of the research in the social sciences (in contrast to the physical sciences) is of questionable value and limited applicability. I have discovered also that in education many of the ideas which are being talked about today as new and valuable are the same ideas which were talked about and put into practice during the Progressive Era in Education in 1900 to 1940.

It is my impression that the difference in research between the social sciences and physical sciences has two major contributing factors. One of these is the complexity and multiplicity of the data available in the social sciences, and another, which I see as most important, is that any real discovery and innovation in theory or practice in the social sciences is threatening. In my experience with schools, teachers, patients and people generally, I am impressed that we all have styles of functioning and relating to ourselves and to others that we

experience as very important in maintaining our sense of self esteem. Many of these ways of functioning and ways of viewing ourselves are not realistic in that they are not the most effective ways of getting what we want and, as a corollary to that, are not true to our most basic needs.

As a result of this, any effective research which shed more light on the way people deal with each other, or on the nature of people themselves, would be experienced as threatening to these styles of functioning which each of us has created. This natural resistance must be acknowledged if education R&D is to be more effectively planned.

As I read the literature in psychology and education, I am impressed that there is much solid work being done. It is also true that there is much work done in each of these fields that is related to practice in the other. It appears, however, that there is no tying together of research and no group which works toward formulating the basic questions and then systematically plans the research which is needed to answer them. The system rewards researchers who write papers. It tends not to reward those who do long term, painstaking studies directed at changing systems—in fact, it tends to punish them because the interests of funding agencies change from year to year or at least every few years.

The research industry in the social sciences can be conceptualized much like a parent-child relationship—one in which the parent is not setting appropriate limits or stating clear expectations. I am not sure the federal government states that we want data that will effect changes in society, but that is implicit—yet there is no long-term planning and direction and little serious expectation that research which is done will be applicable. There is an assumption on the part of the government agencies that the researchers in the field would strongly object to a directed, coordinated R&D program in education. It is not clear where that assumption comes from, but it appears to continue to exist in both the minds of the grant givers and the grantees largely because the federal government has not been willing to think carefully about how an effective program in R&D in the social sciences can be organized.

This is not to suggest that parents or the federal government can from a position on high tell children or researchers what must be done. What I am suggesting is that part of the responsibility of the federal government is to work with, to collaborate with the researchers in the field in formulating a long term research and development program to which both can feel committed. The continuing task of the federal government then is to ask the researchers what they are doing in terms of the commitment that they have made. The planned and directed research in the NASA program may provide some useful guides for a related program in education.

To carry the parent-child paradigm one step further. The federal agencies that are responsible for R&D at the federal level are dependent upon congress and to some degree on the executive branch for their monies and their direction. This is a complex dependency with many parallels to the family. The administrators in R&D throughout HEW are in many cases expert in these areas and yet they have relatively little to say about their programs and their monies. Congress, which has much to say about programs, generally has little knowledge and expertise in these areas.

If congress expects HEW and its R&D administrative staff to function effectively, and if congress expects to function effectively, as a setter of limits and provider of funds, there must be more careful collaboration between R&D administrators and congress. By collaboration, I mean more than just testimony, I mean a working together in grappling with these complex issues, rather than the R&D administrators feeling like pawns in the hands of the legislator, the president and the researchers.

It has appeared to me and to many in this country that the power of the executive branch is increasing in such a way that the people have less say in their government. It appears that part of the reason for this is the complexity of the issues involved and the wish on the part of the public and the legislators for some almighty person to solve the problems in a magical way. The alternative to this is to establish a system where each person's knowledge and expertise can be effectively tapped—where there is a real collaboration of researcher, administrator and legislator.

One of the factors in the federal structure which makes it difficult to function effectively is that the administrative or staff work in the government is being done by persons with primary commitment to the executive branch and often no work relationship with congress. I am not suggesting that I have any answers to this dilemma, but it seems important to look at it in planning a new federal

agency which must be different from the current federal system if it is to fulfill its purpose.

Specifically regarding a National Institute of Education (NIE), I have thought about an intermediate position between congress and the executive branch, a position in which NIE staff would, in an integral way, be tied in with congress (perhaps assist the staff of the House and Senate Subcommittee on Education) and also tied in with the executive branch. The concept of separation of powers is an important one, but it can result in no one taking effective responsibility for the complex problems that the nation faces.

It occurs to me that in the planning for NIE, it would be exciting and profitable if there were continued efforts at real collaboration between the planning group in OE and the subcommittee on education. I understand that such collaboration is, in fact, being planned. In the course of such planning, we may discover some creative and effective styles of collaboration which may be built into NIE.

Respectfully submitted.

SPENCER A. WARD, M.D.

HOPES FOR THE NATIONAL INSTITUTE OF EDUCATION

(A Guest Editorial, by David Krathwhol)

At a time when the commissioner's office is the focus of pressures to solve today's problems *today*, we can be grateful that we have a commissioner with the statesmanship and foresight to vigorously espouse a National Institute of Education, which by its very nature is a promissory note on tomorrow.

It is clear to all that we must move the program of educational research and development to a whole new level of understanding, of funding, and of excellence. Our programs to date have not created among members of Congress, Administration policy makers, or practitioners the feeling of confidence necessary for substantial continued gowth.

A National Institute of Education would provide a new start; a structure more removed from immediate pressures; a higher caliber of administrative and research personnel; a more appropriate level of compensation for that staff; task forces and study groups providing better-focused effort; and an organizational arrangement that brings together the best of lay, practitioner, and research talent for research policy making. This should result in increased levels of funding and attract new talent, some from areas yet untapped. The exciting thing is that these are Commissioner Marland's expectations, not just some researcher's dream.

Much of his presentation richly deserves comment; I have room for only a little.

Commissioner Marland recognizes that, though coordinated with it, the NIE needs to be separate from the USOE. Under the USOE, programs and priorities have been in continual flux, so that programs have not been brought to fruition before priorities have changed. Hopefully, the NIE will be sufficiently protected so that policies can be pursued to meaningful and useful conclusions. Commissioner Marland did not, however, stress sufficiently the need, over the NIE's first few years, for freedom from pressure to "show and tell"—for example, pressing a product into use long before it is reasonably well developed and validated. To prematurely expose products to criticism and possible failure would quickly destroy the NIE's effectiveness.

In a similar vein, the staff of the NIE must feel secure enough to develop a new kind of relationship with researchers. Fear of criticism has resulted in the USOE's supporting only projects that have been very concretely described. Often this has forced a researcher to freeze his design early. It does not encourage the most creative problem exploration. Relationships conducive to attaining this latter goal depend on a kind of professional staffing which will become feasible under the NIE's proposed personnel policies.

Opinions differ as to the most appropriate level of funding for the NIE. The commissioner speaks of training and mentions a fear of glutting an inadequately prepared field. Educational laboratories have demonstrated that, with supervision, much development work can be done by personnel with a minimum of graduate training. Further, recent examination of sample USOE products has shown that development often has been stopped short of complete validation. The NIE must plan more realistically for the costs of development. The NIE may well be able to start profitably at a much higher level of funding than is currently projected.

This raises the problem of securing adequate funding for the NIE. The suggestion of a tax on corporations employing college-trained talent is interesting, for it both assesses those who directly benefit and provides a steady income source. If Congress is loath to assess new taxes, it nevertheless has the power to amortize the costs of future products as a tax against current operations. It can earmark for R & D a proportion of expenditures out of ESEA-type legislation. Perhaps Congress should authorize a proportion, such as 5% to 10%, of each education bill for NIE program support.

Commissioner Marland suggests that the NIE should coordinate the educational research and development efforts throughout the federal government—a most desirable goal, but one very difficult to attain. There are currently few incentives for cooperation among federal agencies. Only if *both* the Office of Management and Budget and Congress provided the NIE with the authority and the incentives for the task should the NIE assume this responsibility.

Despite the commissioner's comments about his and HEW's ability to protect the NIE, it seems very clear that the director of the NIE will have to develop direct ties with Capitol Hill. Curiously enough, the stability of congressional seniority, contrasted with changing personnel and administrations, suggests that direct relations to Congress hold the greatest likelihood of providing stability over a period of time, as well as of affecting funding.

Commissioner Marland sees the NIE as a unifying factor, drawing together science, academic disciplines, and art in the pursuit of better education. Indeed it should do this, and more. It should provide a forum for better understanding by laymen and practitioners of the complexities of educational research and development. It also should provide them with the opportunity to state their problems and their concerns about delays. In this same forum researchers should create better understanding of what research can and cannot do, and especially of the tentativeness with which "truths" are proven. In this forum, laymen, practitioners, and researchers will seek together the best research policy. Out of these discussions should grow support for a new level of research policy that hopefully will result in a substantial difference in educational practice.

I delight in joining Commissioner Marland in seeking the NIE's development in order, in his words, to help bring "education . . . to adulthood."

A New Order of Educational Research and Development

(By Sidney P. Marland, Jr.)

A recent witness at a House subcommittee hearing on the National Institute of Education expressed his conviction that federally sponsored educational research and development would be far more productive if it were removed from Office of Education jurisdiction and placed in the NIE. In a federal agency such as the USOE, he reasoned, interests change from commissioner to commissioner; and experimental failure, the quintessence of the research route to invention, tends to become unacceptable in the vagaries of bureaucratic life.

I am not persuaded that the Office of Education sheds more darkness than light in the land, and yet I agree with his point. If educational research and development is going to be the success it really must be in this country, then it cannot exist in the compromised anonymity of the conventional federal bureaucracy. The time has clearly come, as President Nixon proposes, to establish a focus for educational research and experimentation in the United States. To achieve a genuine impact on education's problems, we must create the setting and the atmosphere in which the crucial and delicate work of research and development can thrive, funded generously, isolated from political and administrative whim, and dedicated to one purpose alone—the discovery and application of new alternatives in education.

First, the National Institute of Education will be a separate agency within HEW, detached from the Office of Education. It will report through the Commissioner of Education to the Secretary of HEW. The NIE will be responsible for the planning and direction of research and development at all levels of schooling, while the USOE will administer operational programs, as it does now. The USOE will, furthermore, be strongly linked with the NIE for the necessary input of ideas and needs, and for the follow-up disseminaton of NIE products.

The director of the institute will be a presidential appointee, according the position the status to recruit a national figure, commanding the respect to at-

tract the very best scientists, educational practitioners, public administrators, and others essential to the high importance of the NIE. Above all, the NIE's director must be capable of developing solutions to pressing educational problems. He need not be overly concerned with administration and congressional relations because these are areas in which the Secretary of HEW and the Commissioner of Education can play a strong supportive role for the NIE without cluttering its affairs with unnecessary governmental restraints.

The director will be assisted by a National Advisory Council on Research and Development. The council will be involved in setting general policy for the NIE and in coordinating its efforts with outside agencies such as the National Science Foundation, the Office of Economic Opportunity, the National Institute of Mental Health, the Office of Child Development, and so on. Some personnel would rotate from the NIE to the Office of Education and back again to maintain close cooperation between the two sister agencies, bringing real-world experience to NIE planning and a high level of knowledge and motivation to the operations of the USOE.

At least two kinds of functioning groups will exist within the institute—task forces addressing major problems, and study groups seeking to understand the nature of the processes of education at a deeper level. Both will consist of permanent NIE staff people, plus outside consultants and short-term fellows of the institute.

Two parallel efforts will supplement the task forces and study groups—an intramural program of research and development, and a researcher-training program operating through institutes, fellowships, and training contracts.

However the staff is organized, certain personnel patterns characteristic of learning research and development agencies will emerge. These distinctive patterns will be made possible in large part by the NIE's authority to hire and compensate technical and professional staff exempt from civil service classification and compensation regulations. This authority, I should stress, will only apply when there is a specific reason to use it; hence very likely many of the staff members will be hired under the civil service system. The special authority is not likely to be used for those engaged in support functions for the agency, such as budget, personnel, and contracts.

The concept of civil service exemption authority builds upon the experience of other successful research and development institutions, such as the National Science Foundation and the National Institutes of Health. As these agencies have found, drawing the highest quality staff for research and development requires staffing patterns and compensation levels specially adapted to the career patterns and professional traditions of the scholarly community. Exemption permits, for example, a system of short-term, noncareer appointments. Distinguished academicians and educators whose permanent career commitment is to a university, school system, or industry could join the NIE staff for even shorter periods to work on a single project. In addition, the authority would permit streamlined hiring procedures particularly suited for short-term, high-level personnel.

With flexibility in recruiting and the ability to pay salaries commensurate with the type of talent that is sought, we hope to attract to the NIE the most significant names in education. But beyond our distinguished colleagues in education, we would also expect to attract their counterparts from many other disciplines such as sociology, biochemistry, psychiatry, medicine, anthropology, and so on.

What will these scholars and academicians do at the NIE? This question is presently absorbing the attention of a good many thinkers and planners, and we feel a broad pattern of priorities is emerging from these deliberations, the principal areas to which the fully functioning NIE will address its organized talents.

Let me stress that such speculation in no way implies limiting the scope of the organization. In truth, as we envision the NIE, the entire universe of educational concerns will be its concern. The NIE will have the range of capabilities required to match the wonderfully varied, endlessly changing, hundred-sided activities of education. It will deal with concrete problems such as education of the disadvantaged, career education, and higher education. But the men and women of the NIE will not be harnessed to immediacy; their purpose will be as broad as the very nature of learning itself. They will look deeply into the learning process in all its physical, biological, and psychological aspects, to explore in an unfettered atmosphere of pure investigation the far reaches of man's capacity to create knowledge and transmit it. The knowledge base upon which education now rests, our ablest scholars agree, is still in its infancy. We purpose to increase it systematically.

More concretely, I would like to sketch for you briefly some of the objectives and plans we have in mind in establishing the institute.

First, it will seek new knowledge and new insights into educational experience. It will do basic research into the learning process in all its sociological and physiological variables. We will want to undertake studies that may not lead to immediate changes in practice, such as the examination of the effects of chemical stimulation upon learning, as well as studies that are likely immediately to influence present policy and practice. The institute will certainly be concerned with increasing the productivity of teachers; it will look for ways to utilize technology to enhance the teacher's life; it will look for ways to make education available and deliverable to all who want it, whatever their circumstances.

Second, the NIE will seek useful alternatives in educational practice in order to offer the people of this country a far wider range of new procedures, new operations, and new products than they presently enjoy. One choice in anything is simply not enough. An elementary school curriculum that works perfectly well in Boston, for example, could be wholly incorrect, ineffective, and perhaps even damaging in San Antonio, Texas. And we must recognize in our schools, at every level, that there is no single ladder for individual fulfillment and success. If boys who love to fix cars are becoming unhappy office managers, somebody is wasting money, talent, and happiness—precious commodities that we waste at our individual and collective peril. We have much to learn about human needs and the capacity of our institutions of learning to help their individuals meet those needs.

Administrative and management issues and problems will be apt topics for the NIE's investigation as we try to establish closer ties between the costs of education and its beneficiaries. For example, we could conceivably develop and extend to the entire nation a plan such as the one Ohio State University will soon begin operating in which students will be allowed to pay for college out of the future earnings of all students. Or perhaps business and industry could assume a specific new tax for higher education, a talent tax that corresponds to the number of college graduates annually engaged.

Third, we see the institute strengthening the nation's research and development capability through the stimulation and training of new scholars. The new respectability of educational research will, I believe, greatly increase the number of competent professional persons engaged in the field. Even in the unlikely event of Congress's appropriating a billion dollars this year for educational research and development, expenditure of such a huge sum, while compatible with other fields of research, might actually cause more harm than good because there are not enough competent people to do the work at this level of investment. And even if we were able to collect together all the talented people in this country who would like nothing better than to work for the improvement of education, we have neither the organization nor the network of communications to absorb their efforts fruitfully.

The NIE will take the responsibility for coordinating educational research and development efforts throughout the entire federal government, as well as for providing general leadership and support to training now taking place within universities and laboratories. The institute will also administer grants, institutes, and fellowships as methods of supporting and encouraging the growth of competence in people committed to educational research and development.

Fourth, the institute will undertake the invention and perfection of ways to deliver educational innovations we know are successful. Whatever sort of breakthrough we achieve in teaching and learning, it will be useless unless it is linked with a system for delivery that works. That is why I maintain that the NIE holds the genius of that central system, flowing collegially, constructively, and systematically through the education network into the classrooms of America. Systematizing the art and science of teaching is one of the principal reasons for the NIE. The art and science of teaching are very human things, changing with the people affected and with the time and place. The NIE must be more than ordinarily, a human institution.

We know there are many sound innovations in education, methods that have proved their effectiveness over and over again. I refer to such techniques as peer tutoring, individual progress programs, and the use of paraprofessionals in the classroom. But we also know that too many school systems are skilled at protecting themselves from the invasion of good ideas and, as a consequence, good techniques such as those I just alluded to—and many more—are serving

only a fraction of the school children of this nation, illuminating only a fraction of the darkness.

The NIE's dissemination efforts will build upon and utilize the facilities and experience of the National Center for Educational Communication, the Office of Education's dissemination arm, and other delivery systems. Parallel with the growth of the NIE, I see a reshaping of the total commitment of the Office of Education to accelerating nationwide use of tested educational improvements resulting from NIE and other efforts. We can no longer accept a situation in which we can deliver a new mouthwash to 200 million Americans in a matter of weeks while a new system of education to freshen the quality of our minds moves with glacial imperceptibility. The dissemination of the NIE's products and processes is one of the principal reasons for the close articulation with the USOE and its vast human network of states, local systems, and classrooms.

To summarize our thinking about the role of the NIE, we believe that the lion's share of the agency's budget would be devoted to mobilizing the ablest scholars and directing their talents to comprehensive research and development programs seeking solutions to education's most serious problems. Some of these solutions will build on the best current techniques—and many will probe radically new approaches to learning. All will lean heavily on development and on the invention of effective means of translating ideas with readily deliverable materials and practices which are worokable—and working—in the field. The institute's independent, creative atmosphere and flexible organization will enable its staff to take a hard look at the common assumptions and hallowed traditions of the profession and expose us to ourselves where we are found waiting, suggesting solutions.

Teams of people with different expertise—research and development personnel, educators, teachers, public officials, engineers, economists, statisticians, artists—will be organized around basic problems. They will plan research and development programs designed to yield new knowledge, materials, and methods and coordinated to provide powerful leverage on each problem. For example, finding successful approaches to educating the disadvantaged might mean supporting a range of projects from basic language studies to designing alternatives to formal schooling for alienated ghetto teen-agers.

As many of you know, when I became commissioner in December several new staff members joined me in the Office of Education. Among them is Harry Silberman, director of the National Center for Educational Research and Development, the Office of Education's present research operation. A principal concern of his has been to reorganize the NCERD in preparation for transfer of most of its functions to the institute while continuing to operate the USOE research and development effort until the NIE becomes a reality. Silberman is already assembling able and lively people to reinforce the NCERD-NIE component during this period of development.

The NIE must be responsive to the Office of Education's role in serving American education broadly. The Office of Education, for its part, must be in a position to help formulate the questions the NIE would address. Further, the USOE must strengthen and expand the delivery system for promoting implementation of the practical results of educational research and development in the field. There is a large new role for the USOE in this context which I call leadership and some call technical assistance. Stated simply, it is that a new idea will be delivered and sustained not only by memoranda and journal articles but by people on call.

To summarize, the NIE would assume most activities now conducted by the National Center for Educational Research and Development. The NIE would become responsible for programs in basic research, ongoing development activities, the research and development centers and regional education laboratories, research training, and construction of research and development facilities.

The Office of Education would retain its responsibility for evaluation and policy-oriented research relating to USOE programs and the gathering and dissemination of statistics. While the NIE would be charged with designing new delivery systems for research products, the USOE would oversee demonstration and dissemination activities and support and deploy whatever new system the NIE might develop.

We look to the NIE to bridge the education and related research and development activities of all federal agencies, activities largely unconnected at the moment. The NIE would act as a clearinghouse for information on relevant programs and provide an intellectual meeting ground where personnel of various government agencies can reason together about educational problems, supporting

each other, avoiding duplication and cross-purposes. For example, extraordinary institutional materials have been developed by the Department of Defense. No systematic arrangement exists for their adaptation and articulation in the school systems of the country.

Before closing, I would like to touch briefly on the projected relationship between the institute and another Administration initiative, the National Foundation for Higher Education. These instruments, while very different, have been confused in the minds of some, perhaps because they are both being advanced in legislation at the same time.

In the broadest sense, the foundation will be a new federal vehicle to help higher education reform itself and renew itself and to help it cope with the realities of increasing enrollment, new social expectation, and accelerating technological change. It will be a device to help colleges and universities decide rationally what *they* want to become and, when they have organized their plans, to provide seed money to help get them under way.

The need for institutional change is forcefully argued in the recently released Newman Report on Higher Education. It states, "The system [of higher education], with its massive inertia, resists fundamental changes, rarely eliminates outmoded programs, ignores the differing needs of students, seldom questions its educational goals, and almost never creates new and different types of institutions." While I do not go along with all of these generalizations as applying to all higher education, the issue is drawn for everyone to consider.

The foundation, we believe, will help turn that situation around by providing aid to develop new kinds of institutions as well as to strengthen those we already have, and by working toward development of a national policy for higher education. While the NIE devises and tests new educational methods at all levels of instruction as a research body, the foundation will encourage the demonstration and adoption of promising practices in higher education that we already know about but haven't fully applied. It will indeed be a foundation, not a research activity. The NIE will deal with broadly based problems and practices, at all levels of education, while the foundation will target on the needs and issues of higher education alone. The same coordination mechanisms linking the NIE to the Office of Education—boards of directors, staff exchanges, and reporting through the commissioner—would join the NIE to the foundation.

The great problems of education have a peculiar endurance. Ignorance lives on today, as it has throughout recorded history, in companionship with learning. The nonreader on the lower East Side of New York City is but the newest recruit to that tragic fraternity, and the child who rejects our educational offerings and consequently cannot benefit from them is very nearly as commonplace as the child who flowers and flourishes to the fullest under education's benefits. And to these antique conundrums of society must be added year after year the pressures and problems unique to our time and place in history and to society's every-rising expectations. One thinks of drugs, environment, and changing career demands, to name a few.

And yet, I think, there is a difference today from, say, 25 years ago or perhaps even 10 years. There is a far wider perception and a deeper understanding of our problems as being detrimental not simply to an individual boy or girl who cannot read, but to an entire nation whose nonreaders and other deprived members constitute a menacing subculture undermining and mocking the security and progress of the rest, and challenging most profoundly our ideals of justice and opportunity for all. This condition gnaws at the conscience of the "successful" more than ever before.

For many reasons, then, practical as well as idealistic, we have begun to attack our educational problems and to probe our educational potential. Our approach is impassioned, as the search for truth and justice must always be. But it is now intended to be systematic and, with the coming reality of the National Institute of Education, intelligent, humane, and productive as well.

The National Institute of Education is an embodiment of very large national aspirations and, with enough money, talent, and fortitude in the face of inevitable periodic disappointment, I believe the institute will bring those aspirations to fulfillment.

In a nation that has attached scientific inquiry with great profit to nearly all of its major interests—medicine, industry, commerce, communications—it is time that education, perhaps the overriding concern of Americans as we rank our values, should come to adulthood.

STATEMENT BY DR. LINDLEY J. STILES, PROFESSOR OF EDUCATION FOR INTERDISCIPLINARY STUDIES, SOCIOLOGY, AND POLITICAL SCIENCE, NORTHWESTERN UNIVERSITY

It gives me great pleasure to have this opportunity to present my views to the committee in support of the proposed National Institute of Education. For over a decade, I have worked with a volunteer group of citizens, educators, and researchers toward just such a goal—the creation of an institution with a long-term mandate to discover and disseminate new knowledge about the field and to sponsor innovations that put knowledge to work to change practice.

Education, which consumes a major portion of public funds at the local level, and increasing shares of state and federal monies, has had to make do with improvised attempts at self-analysis which have been, by and large, fitful and fragmented. The Rand Corporation preliminary study for the proposed Institute points out the meager research and development effort in education, as compared with other fields which make a roughly similar dollar contribution to the Gross National Product. Agriculture, for example, spends nearly five times as much on Research and Development as does education, and devotes almost eight times as many man-years to this function. In the area of health, the comparison is even more invidious—an elevenfold increase in both dollars and manpower. Education is a 55 billion dollar a year enterprise, yet it spends only a fraction of one percent of this total on research, ten times less than is considered barely adequate in private industry. In dollar terms, the approximately 300 million spent on research at the various levels is less than the Research and Development budget of a single large corporation—International Business Machines.

The United States should be devoting at least five percent of its total expenditures on education to the support of a research component. At the federal level, the effort should be far greater—in the area of 10 to 30 percent of all appropriations for education—because experience demonstrates that local and state commitments to research follow the national leadership. It is my hope that the budget for the Institute will reach, at minimum, the level of one and one-half billion dollars a year by 1980. The initial funding of approximately 300 million dollars proposed for the National Institute of Education by President Nixon would equal in one stroke the total now being expended nationally on educational research.

While adequate financial support is essential to an effective Research and Development operation, it would be misleading to suggest that an infusion of funds at the federal level is all that is needed. The internal organization of the Institute, its relationship to the existing U.S. Office of Education, and the emphasis placed on the various types and areas of research will be critical factors as well.

Individual educational researchers have made oustanding discoveries, many of which are mentioned in the Rand study, but the lack of what scientists term a "critical mass" of researchers working on a particular problem has prevented the kind of sustained, correlated, and cumulative effort needed to score major breakthroughs in complex developmental and experimental programs. I would favor the establishment within the National Institute of Education of multiple institutes devoted to specific problem areas, e.g. learning education of the handicapped, vocational education, or reading, along the model of the National Institutes of Health—as was originally recommended by Dean Krathwohl, and also by the Commission on Instructional Technology. It is clear that it is necessary to devise new and better strategies of educational research; perhaps a good part of the answer lies in just this area of critical mass. The establishment of a prestigious and well-funded Institute, able to attract and retain the best researchers and program managers, would go a long way toward creating the kind of sustained and coordinated research programs which are the rule in other fields.

Another advantage of the critical mass concept lies in its interdisciplinary approach, drawing on experts in a variety of fields for fresh insights and different perceptions. Indeed, one of the most important research discoveries to effect education in recent years, the linking of early childhood nutrition and brain development, has come from medical research. The implementation of these findings, which suggest that pre-school lunch and breakfast programs for a significant number of our children may be the most urgent educational priority, will require a substantial and sustained Research and Development effort.

While long-term programs of pure research are essential, education is, in effect, an applied science, and I would hope that the National Institute of

Education would devote about 80 percent of its resources to developmental projects, or what the Rand study terms the "urgent pathologies" of U.S. education. As an example, I would cite the recent recommendation of the National Association of Secondary School Principals that experimental schools be established in all the large systems as permanent laboratories in which to seek solutions to the very serious problems of the urban high schools.

Developmental research will have the maximum practical impact in the shortest period of time, and, in addition, will involve more people at more levels of the educational structure in the programs of the Institute. The National Institute of Education must have a staff of highly competent researchers and program directors, and should carry out research projects on its own, but I would think, again, that a substantial percentage of the studies which it sponsors should be undertaken on a contract basis by individuals and institutions on the local and state levels, or the education industries.

The new Institute should be separate from the Office of Education—a co-equal unit, with both under the authority of the U. S. Commissioner of Education or the Assistant Secretary. This detached status is essential, for the quality research effort which is needed cannot be carried out in an overly political environment, with its narrow interests and uncertain tenure. The proposed Advisory Board provides additional insulation from partisan pressures, and I would recommend that similar boards be appointed for each of the sub-institutes mentioned above.

Yet, the National Institute of Education must avoid the pitfall of "ivory tower" insularity, while at the same time resisting the temptation to make policy by prescribing national goals and standards. Primary control of education properly resides at the local level, where it is most directly accessible to the legitimate inputs of its constituency. The Institute should perform a service function, following the model of the federal effort in such fields as health and law enforcement.

The danger that the National Institute of Education will increase the influence of the federal government in educational policy has, in my view, been recognized by the framers of the proposal, and adequate safeguards have been provided. Such misgivings as exist in this area are far overshadowed by the urgent need to upgrade our educational research effort. Indeed, many experts feel that the very survival of our system of free, open, and comprehensive public education, the backbone of our democratic and progressive way of life, depends upon our ability to develop new structures and programs for the schools. The analogy of the dinosaur has been suggested, and it seems to me to be an apt one. In relation to the complex mass of American education, the knowledge-gathering and coordinating function has become dangerously attenuated.

Ideally, the national research effort embodied in the National Institute of Education proposal will preserve and improve our system of public education in the face of the pressures of a huge, complicated, and rapidly changing environment. At minimum, it will concentrate the resources of the nation on the urgent problems of the present, so that no American child will be denied, through no fault of his own, an equal chance in life.

UNIVERSITY OF HAWAII,
EDUCATION RESEARCH AND DEVELOPMENT CENTER,
July 20, 1971.

Hon. JOHN BRADEMAS,
Chairman, Select Subcommittee on Education, U.S. House of Representatives, Washington, D.C.

DEAR MR. BRADEMAS: Having served as an active educational researcher for almost half a century in governmental jurisdictions extending from New York/Washington to California and Minnesota/Missouri to Texas, culminated by the past six years at the University of Hawaii, I have been deeply involved in both professional and scientific aspects of problems of educational research. Evidence of my active involvement is suggested by various activities I have engaged in as listed in *Leaders in Education, Who's Who in America*, etc.—including presidency of the American Educational Research Association, directorship of major research and development projects such as the National Teacher Examinations and the well-known Teacher Characteristics Study of the American Council on Edu-

cation, and directorship, currently, of one of the relatively few state-supported educational research and development centers. (Although the University of Hawaii Education Research and Development Center have received several million dollars in grants and contracts with the Office of Education, the Office of Economic Opportunity, and other federal agencies, the State of Hawaii, through the University, has provided state-supported personnel, with regular funds for research and development that cannot be externally funded, and with extensive computer services.)

My background is mentioned here at the beginning of my letter simply because I want you to know I write from a life-time of interest and involvement as an educational researcher and that I do, indeed, feel dedicated to support the proposal for a National Institute of Education—at least, insofar as such an Institute will devote a major portion of its activities to *solid* research and development on educational problems and to dissemination of verifiable and generalizable findings.

At the same time that I state my support, I must also admit questions in my mind about the planning of the National Institute of Education. For example, I feel it might be a serious mistake for extensive in-house planning and research to be conducted by the proposed NIE—largely for, three reasons: (1) personnel, except inexperienced researchers, usually are difficult to attract to long-term appointments with a government agency such as the proposed NIE (Many universities, on the other hand, do number among their appointees seasoned educational researchers with the required expertise that could contribute materially to the stated purposes of NIE.); (2) biases, or points of view, that at a given moment may control the thinking of an NIE administration may get a lion's share of attention while equally important educational problems may go neglected; (3) we all recognize that research findings, whether in educational or research, cancer research, or whatever area, often are unique to specific settings and specific conditions operating where the research is conducted, and only when extensive replication with diverse samples of persons, varying details of procedure, etc., are provided for (i.e., when there is support of similar projects in different areas conducted by different researchers) is generalizability possible.

I would hope the proposed NIE might continue to provide assurance of adequate research support to those universities that do possess personnel capable of conducting solid research and development—research that would complement that of other institutions and researchers, including NIE in-house research, thus giving substantially greater assurance that research findings that were sufficiently generalizable could be identified and made available for application to school practice.

Having served on a number of "proposal review" panels and having observed the value of obtaining diverse opinions of the adequacy of methodology and practice proposed by certain research projects, I also strongly feel it would be most desirable—in fact, necessary—for the proposed NIE to provide advisory panels made up of qualified research representatives from the several states as decisions were sought and reached about the administration of the proposed NIE or even a single relatively small Advisory Board. (I refer to the desirability of decision sharing about the desirability of pursuing particular research problems that may be proposed either by the NIE or by persons in schools or universities.

I would further advise that proposals be "invited" for research and that they subsequently be judged, as noted above, regarding their adequacy. This is simply another aspect of the one to which I have already referred, that of determining just what lines of research (from the infinitely large number of unsolved educational problems) would be attempted; that it not be left to the opinions of a few individuals, regardless of how highly qualified those individuals might be.

May I say then, in summary, that I have had a substantial bit of experience in this area of educational research and, as a result, a dedication to the field. It is with this background of research experience and dedication that I willingly offer my services, in any small way I may be of possible help, in supporting the proposed National Institute of Education—at least, if such a National Institute of Education would provide for creative thinking about possible lines of Research, for careful selection of research and development projects, and for "expert" conduct of studies that were selected.

Respectfully,

DAVID G. RYANS, *Director.*

NEW YORK UNIVERSITY,
SCHOOL OF EDUCATION,
New York, N.Y., July 16, 1971.

Hon. JOHN BRADEMAS,
Washington, D.C.

DEAR SIR: I am writing to indicate my support of the National Institute of Education for the United States. There is no doubt that radical change in United States education could occur in the next quarter-century. The decision is up to Congress. New research points to substantive changes in education that will alter the very way educators think about educational problems. An entirely new knowledge base can be developed.

Nothing would equal the impetus to change at this fundamental level more than Congressional approval this year of the National Institute of Education. Such an agency is urgently needed to conduct and support educational research and to disseminate those findings throughout the nation.

The NIE program as presented in the Levien report would assure not only a vastly improved knowledge base, it would result in far better practices in professional schools. Implementation of the NIE would enable schools of education, such as the one at New York University which enrolls 8,000 students, to increase their research activities manyfold; to provide funds for in-service education of teachers; to develop materials to be used in the training of professional educators; and to make available fellowships for full-time study. Ultimately these benefits will reach classrooms at all levels.

No matter how compelling the reasons for change, nor how good the intentions of the professional community, education will not change automatically. A deliberate strategy with large and long-range support is necessary. Therefore, I have urged Congressmen from this area to back the formation of the National Institute of Education, for without the new, massive effort that agency will generate, American education will plod along on four wheels—earthbound in the Space Age.

Very truly yours,

DANIEL E. GRIFFITHS, *Dean.*

SCHOOL DISTRICT NO. 30,
Northbrook, Ill., June 11, 1971.

Hon. JOHN BRADEMAS,
Chairman, House Select Subcommittee on Education,
Washington, D.C.

DEAR SIR: May I submit the following observations concerning a National Institute of Education:

1. A top priority should be assigned to the task of defining the objectives of the public school.

2. Early childhood and infant training must be included in basic research on how people learn. Of equal importance is the inclusion of specialists in medicine, pathology, and bio-chemistry to insure a thorough understanding of the total functioning of the human organism.

Research, for example, currently being undertaken in hypoglycemia and its relationship to learning is of utmost importance to the development of sound learning theories.

3. Teacher training should come after and not before the baccalaureate with appropriate yearly internships carrying stipends provided by a combination of local and state or federal funds.

4. Schools of education should be intimately involved with local schools. Professional personnel should, of course, be connected with local school districts.

5. Systems analysis of schools should be considered of prime importance in educational research. Such analysis should involve questioning of the traditional period, day, year, classroom—.

Systems analysis should address itself to whether or not the economy can sustain one professional for every fifteen to twenty children.

Systems analysis should consider the impact of innovations such as "Sesame Street," and whether or not these will cause a shift of funds from typically certificated salaried teachers to productions and materials.

Selected school districts could pilot a thorough study of a data processing system.

As past director of the Cook County EPDA (Education Professions Development Act) project, I would be more than willing to amplify or further clarify

each remark or observation. I have purposely refrained from commenting on educational finance because I believe that there are more basic issues to be considered.

Sincerely yours,

O. A. CANDELARIA, *Superintendent.*

STATEMENT BY ALVIN C. EURICH, PRESIDENT, THE ACADEMY FOR EDUCATIONAL DEVELOPMENT

(Collaborator Sidney G. Tickton, Vice President)

Mr. Chairman and members of the Committee: We are pleased to have been invited to testify and to submit this testimony on behalf of the proposal to establish a National Institute of Education. We believe that the establishment of such an Institute, and its strong support by the Federal Government, holds more promise than any other single strategy for raising the quality of education for all Americans over the long term.

BACKGROUND

The Institute was recommended by the President in his message on March 3, 1970, which followed by a number of weeks his transmission to Congress of the report of the Commission on Instructional Technology which included a similar proposal. That Commission, composed of educators and professional men with broad backgrounds and with a wide variety of educational and cultural interests, was established by the Secretary of Health, Education, and Welfare in response to the wishes of Congress as expressed in the fall of 1967 in Title III of the Public Broadcasting Act.

In your session on March 12th, 1970, you heard from the chairman of that Commission, Dr. Sterling McMurrin. He reviewed the background of the study, reported in detail on the way it was conducted, and the conclusions it came to about the present and potential role of technology in education.

After more than a year of study, which started first with educational technology and then broadened out into other areas of educational policy and planning, that Commission concluded that its number one recommendation be that Congress establish a National Institute of Education, and that this Institute be authorized to develop support and fund greatly strengthened programs in educational research and development and the application of research findings. The Commission recommended that Congress fund the National Institute and a complement of subsidiary institutes in a manner above and beyond existing educational programs.

Our organization, the Academy for Educational Development, conducted the research and handled the staff work for the Commission throughout the 16 months of its life. I assigned Mr. Tickton to this enterprise as well as a number of our other key people who worked under his supervision in his capacity as Executive Director of the Commission. Although what we have to say is based heavily on the staff work we conducted for the Commission, our testimony is founded also upon the other activities in the Academy which during the past seven years have involved more than 100 research and consulting assignments for schools, colleges, universities, foundations, and government agencies. We are also influenced by the results of our activities at the Ford Foundation where I was Executive Director of the Education Program and vice president of the Fund for the Advancement of Education; and where Mr. Tickton was a Program Associate. In short, we have devoted much of the past fifteen years to encouraging reform in American education on the local, state, and national levels. In that period we have had the opportunity to experience at first hand the difficulties, frustrations, and rewards of seeking to stimulate improvement in schools and colleges.

In the aggregate, then, our testimony is based on activities running back for more than twenty years, a period during which the need for a national organization conducting and sponsoring research and development in education and the dissemination of research findings has not only grown tremendously but has also become more evident year by year. What we have learned through all of these experiences is that no substantial progress will be made in changing edu-

cation unless it is based on solid scientific research and on aggressive development of new techniques based on new knowledge. This is the formula that has put America in the forefront in agriculture, industry, defense, and space exploration. It is high time we applied it to education.

This conviction has been reached by many other individuals and groups who have earnestly studied this problem. We have been strengthened in our conviction of the importance of research, development, and application by the findings of earlier and concurrent inquiries into this field. Similar conclusions were reached, for example, in the recent study, *Innovation in Education*, by the Committee for Economic Development (CED), and in the 1966 Congressional report on automation and technology in education; in the findings of the Harvard Program on Technology and Society; by outsiders at odds with the establishment as well as spokesmen for such groups as the American Educational Research Association; by a committee of the National Academy of Education; and in recommendations proposed to the Commission on Instructional Technology by scholars, the professions, industry, instructional technologists, and practicing educators.

THE PROBLEM: LACK OF PROGRESS IN EDUCATION

Today, the clear fact is that on the whole the educational enterprise is being conducted much as it was a generation or two ago. Of course the numbers are larger with respect to people (that is, students and teachers); with respect to places (that is, location where education is provided in formal classroom settings); and with respect to dollars (that is, the budget both for operating and construction purposes).

On the whole, also, the teachers are better trained and the places are, on the average, somewhat more modern than when we were in school. But the educational process is about the same now as it was then. Children study the same subjects in the same grades in about the same manner as before. There are innovations to be sure; the new math, the new biology, team teaching, language laboratories, teacher aides, some films and TV, driver education. But when it comes to the bulk of the educational process affecting 50 million elementary and secondary school children going to class five hours a day, five days a week, for a total of 1 billion 250 million child-hours in class a week—well, for the bulk of the schools educational activities, the process is much the same as it has been.

Over the years there have been a few hardy souls who have researched and examined the educational process. They have been supported in relatively small amounts by funds from a few foundations and, also during the past few years, by Federal funds allocated to regional educational laboratories and research and development centers established by the Office of Education. Much has been learned from the research. But as the Committee for Economic Development pointed out two years ago much more needs to be known if the schools are to continue to move ahead. Dr. Harold Howe II was bothered by the magnitude of education's research and development needs when he was U.S. Commissioner of Education. He noted that man had barely scratched the surface of man's ability to learn. One day he sent our staff a short agenda for educational research. There were only a few questions, but they dramatized the needs. They were as follows:

How can we reach the children of the slums, who have remained relatively untouched by traditional education?

How can we find out, for any group of youngsters, whether we are teaching them the right or wrong things?

Can those who learn well learn even more?

How can we decide, in view of the explosion of knowledge, what part of the whole field we ought to attempt to teach?

How do we reach those presently unmotivated to learn?

How do we evaluate and alter school organization?

How do we come to a real understanding of what intelligence is? And can intelligence be learned?

At what age should formal education begin? And do parents have a real job to do in this connection?

How do we improve the education of two million teachers without seriously interrupting their teaching careers?

How can we get the most out of the individual student's ability to teach himself?

WHY AMERICA HAS PROGRESSED IN OTHER FIELDS

Consider for a moment what has been achieved in other fields through the deliberate application of trained intelligence. The United States began as an agricultural economy. But despite the natural fertility of land and almost limitless resources, Americans were not content to follow forever the old ways and sought constant improvement. The nation established land-grant colleges, with experimental stations and extension services, and the government went into agricultural research on a large scale. By 1900 only 37 percent of our gainfully employed people needed to be engaged in agriculture. Intensified research meant that by 1964 only 8 percent of our workers were needed to raise all our food. Crops improved, herds produced infinitely more milk and better meat. Even with this small fraction of the population engaged in agriculture, farm surplus products became a major national problem.

Meanwhile, America transformed itself into a highly industrialized nation. Mass production techniques and now the "second industrial revolution" of automation have lifted the standard of living to utopian levels. In industry, as in agriculture, the constant effort is to surpass last year's record. In dynamic industries such as oil, chemicals, drugs, electronics, automobiles, airplane manufacturing, and plastics, the successful companies *organize* for change. They stress research and development and strive to achieve results more effectively. The search is always for greater productivity of the worker, wider market, and better methods.

Similarly, America's progress in health and medicine has been revolutionized through research and scientific discovery and prompt development. It is a startling fact that 90 percent of the drugs doctors prescribe today were unknown thirty years ago.

America's enormous scientific research effort is now attacking virtually every kind of problems—missiles and space ships, water supply, uses of atomic energy, and even the creation of life. We are continuously searching for the new and better.

What is needed in education, then is a research-and-development approach like that in other fields. In industry, health and agriculture, agencies had to be set up to nurture this approach. Research-and-development divisions, health laboratories or institutes, and agricultural experiment stations have been most effective in serving this purpose. Where would we be if we had depended on the practicing farmers for research and development in agriculture, on our managers and operating personnel in industry, or on our general practitioners in medicine?

The Federal government has played an essential role in these other fields—a role it must now assume in education.

Up to now it has done virtually nothing to support the R & D effort in education. The nation as a whole spends less than ¼ of 1% of its total education budget on research. This compares to 4–6% in those fields which are renowned for progress, such as agriculture, defense, and medicine, and with an average of 3% for the other major enterprises of the society. Moreover, the miniscule amounts which the Federal government has appropriated, have for the most part been available only very recently. Eighty-five percent of the money that has even been spent by the Office of Education for educational research has been appropriated in the last four or five years. But it takes almost four years for new knowledge to get published, disseminated, and applied. Thus, our entire educational system has been proceeding substantially without the guidance of any scientifically derived principles and practices.

It is ridiculous to run a $45 billion enterprise without the benefit of scientific guidance to assure that the money is well-spent. There is no comparable area of activity in American society which is so little guided by intelligence and knowledge.

I must make it clear at this point that I am not advocating that we wait upon the results of research before investing more in education. We don't do that in other areas. We don't make the State Department, or the Defense Department, or the highway system wait for additional funds until they have proved that they are using presently-available funds as wisely as possible. The need is urgent to get more money into the schools from the Federal government, particularly the schools in the inner cities. Nothing in this statement should be taken as in any way undermining that urgency. But we are asking for more. Money is not enough. We are asking that education be given the additional investment capital, the seed money, to find ways in which future education allocations may be spent more effectively and efficiently.

The establishment of a federal institution such as the National Institutes of Education would be entirely in the mainstream of American tradition. There are outstanding precedents for federal action of this magnitude in other fields. For instance:

Agriculture.—Since 1862, when President Lincoln signed the Congressional acts creating the U.S. Department of Agriculture and the land-grant colleges, the department has initiated, funded, and supervised a vast program of research, development, and demonstration projects. Today, the department works closely with state agricultural experiment stations, the Cooperative Extension Service, industry, and other agencies in a complex of projects related to rural affairs. Coordination of all the department's research and educational activities is the responsibility of the Science and Education Director, who reports directly to the Under Secretary. They include direct research (for example, at Beltsville, Maryland), research done in cooperation with the state experimental stations and other agencies, the Federal Extension Service which applies research findings to day-to-day rural problems, and the largest library on agriculture in the country.

The federal-state-local agricultural research program comprises comprehensive research and development in agriculture and forestry—ranging from basic research to direct application of R & D results to individual farms, families, and business firms involved with agriculture. The program is financed on a matching-fund basis, with the states matching the federal funds allotted and with counties also contributing to extension services. Currently government funds for agricultural R & D amount to about $450 million annually; industry provides an equal amount in addition. As a direct result of agricultural R & D, the productivity of American farmers has multiplied many times.

Health.—A large part of the nation's biomedical research and training is concentrated in the National Institutes of Health. Federal funds for these activities grew significantly during the 1950s, as Congress recognized important new prospects for improving the nation's health through research (triggered in part by the discovery of the Salk vaccine and spectacular developments in the new sulfa, antibiotic, and other drugs). By 1970 the total budget of the National Institutes of Health (including ten separate research institutes and certain other responsibilities, notably health manpower) is expected to be $1.5 billion.

The National Institutes of Health is primarily concerned with research—not development—and with education in the health field. Nearly 90 percent of NIH-sponsored activities is "extramural," i.e., it is carried out through grants to universities, medical schools, hospitals, clinics, etc. The remaining 10 percent includes NIH's own extensive research activities at Bethesda, Maryland. Although the National Institutes of Health is part of the Public Health Service on the official organization chart, the head of NIH reports directly to the Secretary of Health, Education, and Welfare, through the Assistant Secretary for Health and Scientific Affairs.

NIH-sponsored research has made possible a better understanding of the underlying causes of cancer, heart disease, and other illnesses—an understanding which brings closer the day when these diseases will be successfully cured and, ultimately, prevented. Development of a rubella vaccine, improved treatment of acute leukemia in children, and a successful cure of a rare cancer affecting young women (choriocarcinoma) are but a few of the fruits of NIH research. Other developments, such as progress in the deciphering of the genetic code, have far-reaching implications for the entire field of medical and biological sciences.

THE SOLUTION: FEDERAL SUPPORT OF R&D IN EDUCATION

Education has long needed a national research effort, commensurate with those in agriculture and health, focused on the improvement of learning and teaching. Now is the prime moment to bring all available resources to bear in strengthening educational research, development, and innovation, which for far too long have commanded insufficient funds and talent.

While many basic questions still remain unanswered or disputed, there are encouraging additions being made to man's understanding of the hows and whys of human learning in all its variations. One important reason is the gradual coming together of research specialists who once operated almost in isolation: new findings from the laboratory studies of human and animal learning, for example, are interacting with findings from actual classrooms.

Today America needs to examine the basic assumptions (too often unexamined) on which schools and colleges operate. If indeed schools are to be humane environments for learning and not mere institutional accumulations, if

diplomas and degrees are to be more than mere passes to economic and social acceptance, America's vast decentralized educational "system" must undergo a revision that draws upon the best insights that can be cultivated: from scholars of diverse disciplines, teachers, philosophers, and artists, administrators, citizens generally, and from the ultimate consumer—the student.

In recent years, the Federal government has spent increasing amounts for education. Under the Elementary and Secondary Education Act of 1965, for example, about $4 billion has been allocated to upgrade education in deprived areas. But these funds were not invested to get to the roots of education's problems, nor to design a system with more adequate theoretical and technological foundations. The money has been used primarily to repair and extend the present system.

The nation's investment in education must be increased and its thrust changed if America is to resolve its present basic educational and social problems. To be sure, public expenditures on education are nominally accepted as an "investment" in the nation's economic and social future. But the situation today requires that substantial funds for education be allotted for investment more strictly construed: as capital to create an improved system of teaching and learning which will produce more real individual and social achievement for each dollar spent than is done by the present system.

The problems of teaching and learning could yield to an organized and systematic attack, and that the refinement and imaginative use of instructional technology could contribute signally to the success of that attack. Certainly the solution of education's problems is as critical for the nation's future well-being as is a cure for cancer, heart disease, or stroke, or the development of more efficient techniques for growing and harvesting wheat.

I note that the legislation before you stresses equality of education. The Institute is envisaged as promoting true equal opportunity throughout American schools. This is, indeed, a first priority for our times. Yet I would like to stress, too, the fact that the Institute, and the progress it would spark, offers the best promise of improving the quality of education for all children.

We tend to be satisfied with the education currently being provided for the "advantaged" children who live primarily in the suburbs surrounding our cities. And it is true that they are not submitted to the indignities, the physical harshness, the psychological brutalities, of the children trapped in the ghetto schools.

But suburban children aren't all that lucky. We do far less for them than we could. Increasingly, they show signs of being bored with schooling, with getting turned off around grades 4 and 5, of finding the curriculum irrelevant, of resenting the techniques used to teach them. Unless we can find new ways to engage these children in the educational process, they will withdraw more and more into their own world of television, socializing, and even drugs.

The proposed National Institutes of Education—well-funded, broadly based, and building on present strengths and successful programs (public and private)—would give concentrated leadership and direction to a national effort to improve learning and teaching at every level of education. The organization should start with a few component institutes focused on critical areas.

The National Institutes of Education and its component institutes would undertake a limited amount of research, development, and application themselves. This proportion should be relatively small, however—perhaps 10 to 15 percent. The majority of the work should be executed through grants made by the institutes to selected institutions, both public and private.

We recognize the importance of conducting both basic and direct research. Basic research, in which the investigator is free to formulate his own questions, can lead to far-reaching discoveries which could not be defined in a blueprint for investigation. On the other hand, directed research, in which the questions are clearly structured, can be a powerful tool for achieving specific desired results.

Each institute should establish subsidiary research, development, and application programs, tied in closely with individual institutions and with existing and projected regional centers. The National Institutes of Education and its component institutes should work closely with state educational agencies, especially state departments of education, and with the Education Commission of the States.

To insure maximum effectiveness and influence, the National Institutes of Education should be a strong arm of the Department of Health, Education, and Welfare, reporting directly to the Assistant Secretary for Education.

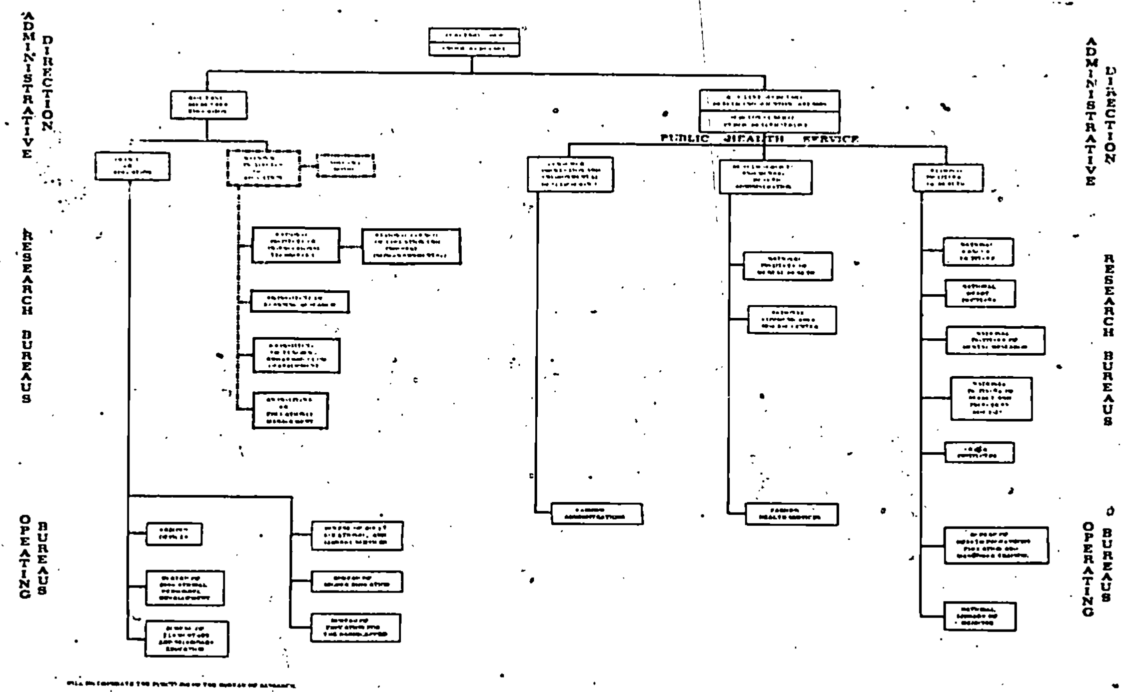
The National Institutes of Education should be headed by a director with outstanding qualifications appointed by the President and aided in policy making by a small strong top-level Advisory Board, composed of government and non-

government representatives. Each constituent institute should also be headed by a highly qualified director. Together the Advisory Board and the directors would act as a council to coordinate the work of the NIE.

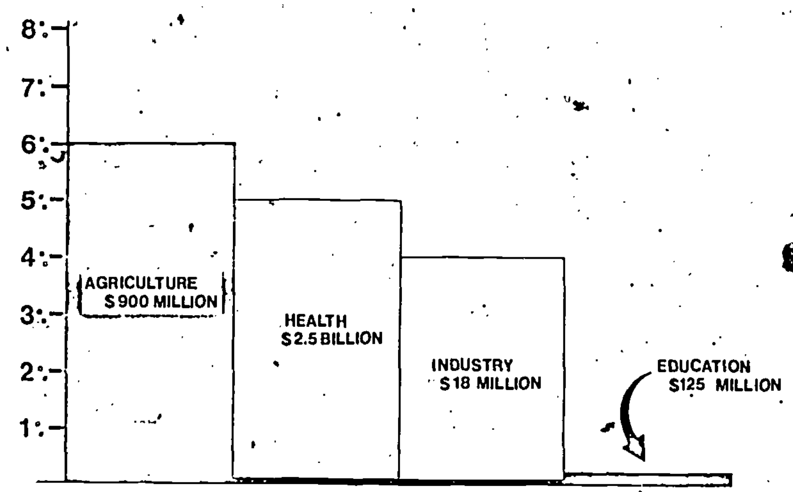
Through its national visibility and stature, the National Institutes of Education should build up educational research, development, and application throughout the nation. Everywhere—in universities and school systems and state departments of education—there are able, dedicated people working on new approaches to solving educational problems. The National Institutes of Education should strengthen promising work now going on, encourage initiative and invention, and support a diversity of approaches to critical problems.

NATIONAL INSTITUTES OF EDUCATION

PROPOSED ORGANIZATION COMPARED TO NATIONAL INSTITUTES OF HEALTH



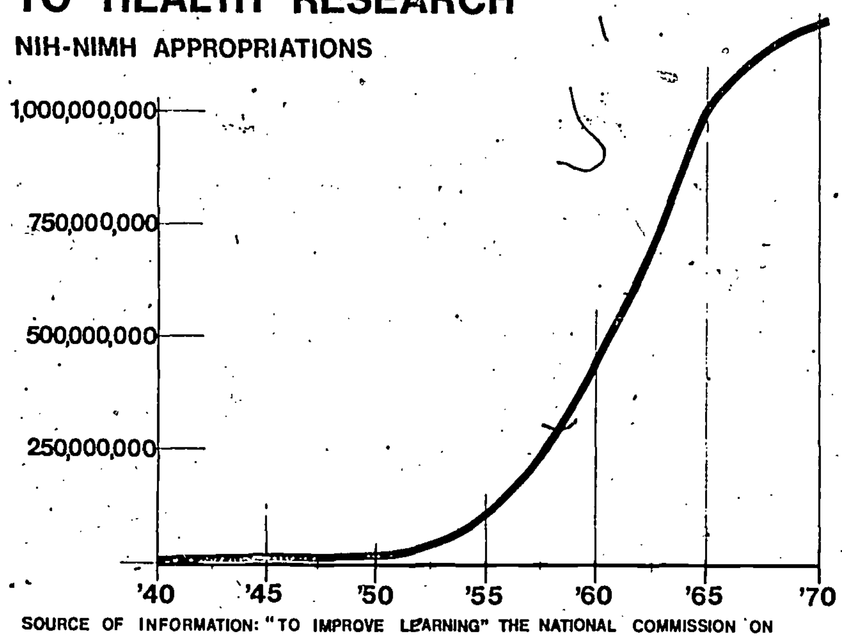
NATIONAL COMMITMENT TO RESEARCH AND DEVELOPMENT IN VARIOUS FIELDS



SOURCE OF INFORMATION: "TO IMPROVE LEARNING" THE NATIONAL COMMISSION ON INSTRUCTIONAL TECHNOLOGY

GROWTH OF THE FEDERAL COMMITMENT TO HEALTH RESEARCH

NIH-NIMH APPROPRIATIONS



SOURCE OF INFORMATION: "TO IMPROVE LEARNING" THE NATIONAL COMMISSION ON INSTRUCTIONAL TECHNOLOGY

STATEMENT BY LEO G. BYRNE, DIRECTOR OF RESEARCH, SCHOOL DEPARTMENT, HARPER & ROW, PUBLISHERS

Mr. Chairman and distinguished members of the House Select Subcommittee on Education:

I am pleased to be able to submit to you some observations and recommendations relative to the National Institute of Education which is to be established under the draft legislative measures designated as H.R. 33, and H.R. 3606.

I have been watching the progress of the legislative hearings and the evolution of associated items since the spring of the current year when I became Director of Research of the School Department of Harper & Row, Publishers, Inc. Prior to assuming that responsibility I functioned for almost four years as Editor in Chief of the same publishing department. My involvement in school publishing extends back to 1950 and includes experience in writing, editing, and marketing. Each of these activities called for constant contact with classroom teachers, curriculum specialists, academic personnel, and school administrators.

That background, I believe, gives me a base of authority for submitting certain recommendations and raising particular questions which may have been overlooked among the items brought to your attention.

Because you have heard a great deal of testimony I will limit myself to two areas, specifically, that of current educational research and that of current educational programs with particular reference to the place of the modern textbook in education and the role of the National Institute in helping producers of educational materials compile the best possible material.

CURRENT EDUCATIONAL RESEARCH

Since much of the pre-planning that has been undertaken in relation to a National Institute of Education and much of the testimony you have already heard has been addressed to the topic of educational research I would like to insert into the record some cautionary notes and to frame some questions which I believe should be answered before a table of specifics is imprinted on the structure that is proposed either in the enabling legislation or in the blueprint that is attached to the resulting Institute by virtue of the testimony submitted to you thus far.

In the study entitled *The National Institute of Education: Preliminary Plan for the Proposed Institute*, prepared by the Rand Corporation for HEW, copy of which you graciously sent to me, Mr. Chairman, and in subsequent testimony before the Subcommittee much has been said about the relative lack of research in education. Statistical data on expenditures for educational research have been compared to research disbursements compiled for major industrial areas and federal activities outside the field of education. The discrepancy is alarming.

I submit, though, that the parallels indicated are something less than scientifically accurate. Within the vast structure of American education there are countless items that are in the category of basic research or that are research-oriented which are not budgeted or identified as research in any fiscal report. Think, for example, of the research efforts and expenditures involved in thousands of individual graduate studies which are not identified as research in the budget of the university, governmental agency, or in any personal financial report filed by the individual pursuing the study. What research-dollar factor is attached to the temporary loss of earnings experienced by the graduate student? Or to the man hours contributed to that student's efforts by graduate advisers and members of doctoral committees? How many school systems budget under research the salary of a classroom teacher assigned to a pilot study of new curriculum materials or new instructional techniques? In private industry, on the other hand, salaries of research personnel and all attendant expenses are correctly included and reported as research expenditure. These are but two instances, Mr. Chairman, of how line-item budgeting, alone, might explain some of the disparity in the allocation or non-allocation of research funds.

Of and by itself, the foregoing analysis may be of little significance. I introduce the item as a cautionary note and I am forced to wonder how the figures introduced in the data were arrived at. I might add that I have heard the identical figures repeated in subsequent and non-related educational meetings and in no case has a verifiable source been cited. Too often, gentlemen, have we seen loose estimates transformed into hard-rock, uncontested facts.

THE ERIC SYSTEM

A direct examination of the status of current educational research might be more revealing and convincing. A convenient vehicle for such examination exists in the apparatus we know under the acronym of ERIC. Without going into the history of the ERIC system I simply note that there is a cataloging of a vast reservoir of existing research—one that, in the main I think it safe to say—lies serenely untouched and unexplored. The complexity of the system itself is such that one now needs a corpus of tools to probe for the hidden treasure. None of these remarks is to be interpreted as derogatory of the ERIC system. The question is, rather, is that system being used? Is existing research known, utilized, tested?

A partial listing of the major tools, that is, the tools universal to the system as distinct from the additional tools unique to the individual clearinghouses within the system is useful in achieving a perspective of the research that does, in fact, exist.

The following list is taken from the ERIC publication *How To Use Eric* (HEW—1968, OE-12037-A)

CONTINUING PUBLICATIONS

Research in Education—a monthly abstract journal reporting research projects funded by USOE, and other research items judged to be of educational significance by the several clearinghouses.

Research in Education: Annual Index.

Thesaurus of ERIC Descriptors—a structured compilation of approximately 3,200 (in 1968) terms used to index and enter documents into the ERIC system.

HISTORICAL COLLECTION

Office of Education Research Reports, 1956–1965—Research reports received before the publication of Research in Education . . . compiled in two volumes: *Resumes* and *Indexes* of reports by author, institution, subject, and report numbers.

Quantitatively, what are we talking about here? I have no official figures for the current volume of research items listed in the ERIC storehouse but the following indicators will serve as a gauge;

(a) from November 1966 thru September, 1968, 8675 titles were listed in the cumulative issues of Research in Education. (cf. How To Use ERIC, p. 10)

(b) the Thesaurus described above was revised and a second edition published in 1970. In the preface to the 1970 edition it is described as still being in a stage of "adolescence." (cf. Thesaurus of ERIC Descriptors p. 10). As of July, 1971 at least ninety new descriptors had been added by the twenty clearinghouses. (cf. ERIC/TM NEWS, Vol. 1, No. 1 ERIC Clearinghouse on Tests, Measurements, and Evaluations—ETC, Princeton) The same source states, "unfortunately, because new terms are added each month the Thesaurus is out-of-date at the moment it is printed."

THE ERIC/CRIER CLEARINGHOUSE

A closer look at the complexity of the ERIC System can be gained by focusing on just one of the twenty clearinghouses. Since the area of reading is the universally recognized priority problem area, a scanning of that clearinghouse, ERIC/CRIER, is in order. In the interests of brevity I will simply list some of the special resources available from that source in the area of research on reading. Please note that here, again, the quantitative data is several years old. The source is the *Portfolio of Information on Reading Available from ERIC, ERIC/CRIER,* and *IRA* published by ERIC/CRIER in 1968.

BASIC REFERENCES ON READING

Published Research Literature in Reading, 1900–1949—presents 2,883 citations and annotations . . . compiled on a yearly basis by the Reading Research Center of the University of Chicago.

Published Research Literature in Reading, 1950–1963—presents 1,913 citations and annotations . . . prepared by the Reading Research Center of the University of Chicago.

Published Research Literature in Reading, 1964–1966—presents 849 citations and annotations . . . prepared by the Reading Research Center of the University of Chicago.

USOE Sponsored Research in Reading—items already listed in RIE, etc.

Recent Doctoral Dissertation Research in Reading—Lists dissertations completed in colleges and universities since 1960 in the areas of pre-school, elementary, secondary, college and adult reading. . . . A comprehensive analytical abstract . . . reported for each dissertation. . . . Three hundred seventy-nine theses are listed alphabetically by author.

International Reading Association Conference Proceedings Reports on Elementary Reading—Lists . . . 345 papers . . . (in 16 categories).

The list of research collections goes on for several pages, Mr. Chairman, and for the sake of completeness I list only the headings for general collections on a level with the heading above, BASIC REFERENCES, etc.

BROAD SUBJECT BIBLIOGRAPHIES; BIBLIOGRAPHIES RELATED TO ERIC SPECIAL COLLECTION PUBLICATIONS; SPECIAL BIBLIOGRAPHIES AND REVIEWS; INFORMATION ANALYSIS PRODUCTS

Qualitatively, Mr. Chairman, the ERIC System is a magnificent accomplishment. All those who have functioned in it and those who continue to function within it deserve the highest praise. I fully believe that it is a research apparatus that is unrivaled.

The point is that the treasury of research it catalogs is almost unbelievable in extent and beyond the assimilative capabilities of many research/lifetimes. This is not a unique, personal conclusion.

Private conversations with some of the principals of the ERIC system corroborate the judgment that the system is woefully underutilized. Some of these men and women are making concerted personal efforts to convince educators to dig into the system and start retrieving the ore-bearing lodes beneath the surface.

By way of underscoring the recognized non-utilization of ERIC, I quote from the Preface to the Thesaurus written by Dr. Frederick Goodman of the University of Michigan:

"Thus, very few people have ever been in a position to use the depth of indexing that indexers have provided from the beginning. In this sense the relatively deep indexing has been 'wasted' to date, and, by the same reasoning, it might be argued that the relatively complex structuring of terms within the Thesaurus has been 'wasted' to date. As ERIC begins to expand its capacity for computer searching, as it is now doing, the deep indexing and the Thesaurus are likely to become much more important." (cf. Thesaurus of ERIC Descriptors, p. 10). And again,

"Very little is known about the people who have been using the ERIC Thesaurus, why and how they have been using it, and what they think of it." (ibid., p. 23).

Finally, gentlemen, please remember that ERIC does not claim to list all known research.

In summary, Mr. Chairman, it seems to me to be dangerously misleading to speak glibly about the paucity of educational research when we face the herculean task of utilizing the research we do have available.

It is not easy to assume the unpopular role of questioning the impressive array of testimony submitted to you thus far, Mr. Chairman, but someone must pose the question before we rush into yet another cycle of needless replication of existing data.

Nor, again, is this a singularly personal position. More than a few educators, at the university level and at the administrative level have privately expressed the fear that many more millions of dollars will be spent in a wave of duplicate research while practical problems continue to beg solution. At the conclusion of the hearings in Chicago, Mr. Chairman, one educator remarked, "Well, here we go again, some guys are going to be paid to discover the wheel."

I am convinced that such is not the intent of the legislative proposals nor the goal of your Select Subcommittee, Mr. Chairman, therefore I presume to urge upon you the following:

RECOMMENDATION

That the Select Subcommittee recommend that it is the explicit intent of the Congress that the National Institute of Education consider it mandatory as a first order of business to devise ways and means of searching out, checking, and refining existing research currently cataloged in the ERIC System.

CURRENT EDUCATIONAL PROGRAMS

Not totally distinct from the matter of current educational research is the question of current educational programs. When sweeping generalizations about the poverty or inefficiency of existing programs are removed from the arena of debate one is left with the simple proposition that there are many good and viable instructional programs in our schools today along with many poor and inefficient ones.

These programs are generated from a variety of sources. Some are developed by individual school systems, some have their origin in one or another curriculum research group, and still others, Mr. Chairman and distinguished members—and I am sure you will pardon the sarcasm—still others, including textbooks, are produced as commercial products by private firms in the education industry. But the great majority of modern programs are based in research regardless of source.

It is to the latter category of programs—specifically, the modern textbook, that I would like to turn the attention of the Subcommittee at this time. For some time we, in the textbook industry, have let go unchallenged many statements that are derogatory or, at best, half truths. Usually these statements are based on misapprehension or ignorance of the modern textbook and most of us in the industry have adopted a "truth-will-out" stance. My sense of self-respect impels me to speak out at this time.

Let me state very clearly, however, that despite a commonality of interests the textbook industry is composed of people who prefer to speak for themselves. In no way do I claim to speak for anybody but myself though I am confident that many of my colleagues would echo what I have to say.

According to the latest figures available the elementary and secondary schools of the United States spent nearly one-half billion dollars for textbooks in 1970. Absolutely considered, even in this inflated economy, that represents an awesome sum of money. In perspective of total expenditures, however, that sum represents but a minute percentage of the secondary/elementary dollar. Either way one chooses to regard the matter the role of the textbook and other instructional tools should be a proper object of study for a National Institute of Education. Yet, in the Preliminary Plan referred to earlier, the textbook is barely mentioned. If the textbook is even half as bad as its most vociferous critics claim it is, then it is an obstacle to good education. On the other hand, if it is only half as good as its most ardent proponents claim, then it is still a valuable and indispensable tool that should be strengthened and perfected.

In passing, Mr. Chairman, I would like to note an incident that is still very fresh in my mind. Not long ago I participated in the deliberations of one of the regional seminars on reading held under the auspices of the Office of Education. During the course of the proceedings I was involved in a small group discussion of teacher-college faculty members. At one point a member of the group began an attack on textbooks that made me wonder when he had last seriously examined a modern textbook. I thereupon asked the group as a whole if any one of them had, within the last few years, really looked at a modern reading program. All of them were honest enough to admit that they had not done so.

I mention this incident because I am personally convinced that much of the criticism levelled against textbooks is in the 'beating-a-dead-horse' or 'straw-man' category. Textbooks, in these situations, are spoken of as if they were produced and published "in vacuo," so to speak, and are contrasted to multimedia techniques, etc. I frankly do not know a major publisher who offers such restricted programs to the schools. Modern reading programs, for example, in the K through 6 range usually include several hundred single items and come complete with a full range of tactile, manipulative, audiovisual devices and aids. The textbooks of twenty or thirty years ago are just that—they are obsolete, they have passed away, just as the classroom of the 1930s and 1940s has passed away—unless local lethargy has allowed them to continue.

VERIFICATION AND REVISION

But you have heard a charge made before this Subcommittee that, along with other instructional materials, textbooks are still produced, sold, and used in the schools virtually without any effort to test the validity of the instructional content in them.

I am referring, specifically, to the statement of Mr. P. Kenneth Komoski before this Subcommittee on May 11, 1971. Mr. Komoski's statement covered many points and I agree with most of what he stated. But the overall tone of his statement, together with significant omissions of relevant facts, seems to have created the impression that textbooks are produced by whim and distributed to helpless school administrators with arrogant disregard for pedagogical validity. The fact that this impression was distilled and so reported in national news media makes it imperative that a balance be inserted in the record of these hearings.

Let me say a word to the point of the telephone survey Mr. Komoski refers to on page 23 of his statement. This survey did not include Harper & Row's School Department. I cannot fault Mr. Komoski or EPIE for that, however, for I realize that a telephone survey sampling cannot be considered a complete investigation. But there are several factors I would like to have included in such a survey.

In the first place, we definitely have had some experience in field testing of the type Mr. Komoski urges. A program under development incorporated indicated revisions based on learner verification procedures. But the cost was very high—not so much in the mechanics as in time. If the results in the sense of indicated revisions had been significant then we could have said the time delay was worthwhile in terms of what we learned. The changes were really insignificant and I think the explanation is twofold. The cumulative experience of our authors and editors produced a good program to begin with, and the cooperation of the schools left something to be desired. It is exceedingly difficult for most schools to properly monitor an experimental program. You may have noticed that Dr. Barak Rosenshine of the Bureau of Educational Research at the University of Illinois touched upon this problem in the recent Washington, D.C. conference on "How Teachers Make A Difference" (cf. Education Daily, 7/16/71, p. 4).

Secondly, the term "field-test" is elusive and means just about whatever the user wants it to mean. I noted above (3.4.2) that a modern reading program usually consists of several hundred single items, takes anywhere from three to eight years to produce, depending on the base from which the developer starts, and demands an investment of many millions of dollars. How does one go about field-testing such a program? In fragmented units? The results would be little more than interesting—this would not give valid information on the total program. What then? After all the components are finished? If so, for how long should the test go on? For one year? What would that tell the educator or developer about the retention factor of what is learned? A really valid field test is one which would require several years and discount Hawthorne effect and other variables before anyone could say, on the basis of field testing that program X or program Y really works. It would require scientific follow-up through several grades to determine how well children retained learned skills. A consideration of the population mobility factor alone leads one to doubt the feasibility of reporting certifiable results in such a procedure. The problem of field-testing is massive but does this mean the situation is hopeless and completely unsolvable?

No, because a third factor has been overlooked. Major textbook programs, especially at the elementary school level, are seldom produced "de novo," without benefit of author/editor experience or company history. Most major textbook publishers have their material in a constant state of verification and revision, and when and if a company decides to venture into a "new" curriculum area it does not proceed blindly or haphazardly. Such a decision invariably involves securing of competent authors who have taught, tested and retested the materials they put into their programs and recruitment of editorial personnel well-grounded and experienced in the "new" subject area.

Classroom teachers, indeed, are heavily involved in textbook preparation and revision, far more, I know, than they realize or believe. Their letters and suggestions are carefully noted (and balanced, incidentally, with diametrically opposed letters and suggestions). Their verbal statements to salesmen are important, too, even if this is a mechanism that does not have the trappings of

sophistication. The test of the marketplace is a valid one, Mr. Chairman, and must proceed along with scientifically normative procedures.

To imply, then, that teacher resistance to change, or failure to look for learner-verification is a major factor in the continued use of older programs when "new" or "learner-verified" materials, produced by Federally-funded curriculum research groups, are available is a dangerous oversimplification. It does a disservice, too, to thousands of teachers. There may well be an additional factor: the failure of the allegedly "learner-verified" materials to live up to expectations. I have heard secondary science teachers roundly criticize some of the "new" materials and furnish specific instances of criticism—just as they do with any other program. Learner-verification in particular instances is not a sole guarantee of universal learner success. There are too many variables involved. Again I refer you to the remarks of Dr. Rosenshine (3.5.3) who asserts that only one of the curriculum research groups is maintaining a check on the use of its materials.

To say, further, that educators buy currently available material simply because there is nothing else available proves nothing. It is analogous to saying that people buy piston-engine automobiles because nothing else is available. Such an observation is a truism—it does not per se prove that a possible alternative mode of transportation would match the all around utility, safety, economic feasibility, and proven performance of the piston-engine car despite the known deficiencies of that instrument.

None of the foregoing is to be considered as reflecting a posture that is opposed to field-testing or learner verification. On the contrary, I support a valid system of such evaluation. I do not support the suggestion that an intermediary between the National Institute and the producer serve as an agency of evaluation. The National Institute of Education has within its proposed structure the necessary flexibility of direct contact with producers. The cost of such evaluation is beyond publishers, Mr. Chairman, but an analogy to R & D provisions in the Defense Industry suggests that the problem is not insoluble. I urge, therefore,

RECOMMENDATION

That the Select Subcommittee recommend that it is the intent of the Congress that the National Institute of Education esablish machinery and a sysem of grants to enable producers of educational products and cooperating school districts to initiate and effect valid methods of evaluation of educational materials.

CONCLUSION

In conclusion, Mr. Chairman and distinguished members of the Subcommittee on Education, I would like to refer to an overall point of view that seems to offer a panacea for educational problems. From many sides there is a growing clamor for management expertise in education. Certainly, this is a valid goal. Management techniques are effective and are needed in education. But we cannot ignore the fundamental principle that education is, in many respects, an exercise in human creativity. Creativity, with all its unanticipated bursts of energy, its surprising twists and turns, does not emanate from flow-charts or tables of organization. Creativity defies the stereotype, the ordained outcome.

Reflect for a moment on the juxtaposition of the two words, "institute" and "education." Hosts of young people have fled the world of formal education for the very reason of its stereotyped institutionalization. A National Institute of Education must never institutionalize at the expense of creativiy in education. It must listen to all who are involved, not impose the view of a new establishment.

Thank you.

ABSTRACT

Mr. Chairman and distinguished members of the Select Subcommittee on Education:

I address you from the vantage point of many years in educational publishing and I submit to you certain observations relative to the proposed National Institute of Education.

The state of educational research is not as hopeless or hapless as it is often represented. The ERIC system alone embodies a vast amount of research that has not been explored. Among the original purposes of ERIC was the avoidance

of duplicate research. It should also be one of the objectives of the National Institute of Education. I urge that the R & D function of the Institute be charged with an intensive search of current educational research as it is embodied in the ERIC system.

Current educational programs, including those produced by commercial firms run the gamut from the very poor to excellent. I urge that the Institute be charged with the obligation of a realistic examination of these programs. Such examination should not be prejudiced by preconceptions of any kind. Additionally, the Institute should be charged with the obligation of giving logistic and financial assistance to producers of educational materials in order to initiate and refine procedures of evaluation prior to general distribution of such materials.

Supportive data and reasoning are found in the body of this statement.

National Institute of Education: Preliminary Plan for the Proposed Institute

(By Roger E. Levien, Study Director)

A Report Prepared for the Department of Health, Education, and Welfare

PREFACE

This report presents the findings of a preliminary planning study for the proposed National Institute of Education. It conveys a picture of the NIE derived from discussions and meetings with a wide range of individuals from government, education, and the research and development (R&D) community, and from examination of prior studies of the organization of R&D institutions. The report has benefited considerably from the suggestions and comments of the many individuals from government, education, and R&D who examined it in draft form. The purpose of this report is to present a sufficiently detailed picture of the possible objectives, program, organization, network of relationships, and initial activities of the NIE to permit careful review by those concerned with the Institute's creation.

Planning for the NIE is and must be a continuing process. Its first stage produced the concept described in President Nixon's *Message on Education Reform* of March 3, 1970, and the NIE Bill introduced in the Congress at that time. This study was the second stage. Subsequent stages will occur during the Congressional hearings on the NIE Bill and after the Institute's formation and will continue as long as it retains the capacity to renew itself as circumstances change. This plan, then, is truly preliminary; it should be viewed as part of a continuing evolution.

Among the subjects that must be addressed during the next stage in planning are details of staff, budget, and program for the NIE. For an enterprise with so large a prospective scope as educational R&D and so small a current effort, budget and staff depend not so much on the identifiable need as on the practical availability of personnel and financial resources. Determination of that availability depends, in turn, on a careful effort to develop a program for the NIE that identifies what can be done and how much it might cost. Thus, a central focus of the next stage in planning must be an extensive effort to develop such an *Agenda for Educational Research and Development*.

Please read this report carefully and consider the National Institute of Education it portrays. What has been left out? What has been included that should not be? How might the proposed Institute be improved?

SUMMARY

In his *Message on Education Reform*, 3 March 1970, President Nixon proposed creation of a National Institute of Education to serve as "a focus for educational research and experimentation in the United States." At the same time, bills were introduced in the Congress to authorize an NIE with the following characteristics;

Purpose.—To *conduct and support* educational R&D, disseminate its findings, train educational R&D personnel, and promote coordination of educational R&D within the Federal government.

Location.—A *separate agency*, equivalent to the Office of Education in status, within the Department of HEW.

Director.—Appointed by the President, with Senate confirmation, to an *Executive Level V* position (equivalent to Commissioner of Education at present).

Advisory Council.—A 15-member *National Advisory Council on Educational R&D* would advise on matters of general policy and review the state of educational R&D.

Personnel.—Professional personnel could be appointed *without regard to the Civil Service System* as deemed necessary by the Secretary of HEW.

Funds.—Funds appropriated would remain available until expended.

The pending legislation leaves unanswered a wide range of questions concerning the NIE. This planning study was undertaken to develop a more detailed picture of what the NIE might become. Five major categories of questions concerning the proposed Institute were addressed: its objectives, program, organization, relationship with the educational system, and initial activities. This report attempts to provide a coherent, reasonably detailed set of answers to those categories of questions.

What would the NIE's objectives be?

The *primary objective* of the NIE would be: *To improve and reform education through research and development.*

Improvement and reform of three specific kinds would be sought: increased equality of educational opportunity, higher quality of education, and more effective use of educational resources. Education in all settings, both within schools and outside of them, and of all Americans, before, during, and after the traditional school ages, would be within the NIE's scope of interest. And all kinds of R&D activity, from basic research to large field tests and demonstrations, would be in its repertoire.

To attain this primary objective, the NIE would undertake efforts directed toward four specific *supporting objectives:*

I. To help solve or alleviate the problems and achieve the objectives of American education.

II. To advance the practice of education as an art, science, and profession.

III. To strengthen the scientific and technological foundations on which education rests.

IV. To build a vigorous and effective educational research and development system.

What would the NIE's program be?

The design of the research program would follow from the NIE's objectives. Associated with each supporting objective would be a major *program area* of the Institute:

Program Area I.—Solution of major educational problems.

Program Area II.—Advancing educational practice.

Program Area III.—Strengthening education's foundations.

Program Area IV.—Strengthening the research and development system.

These program areas would be divided, in turn, into several *program elements.* The number and definition of the program elements in an area might change over time as priorities and competencies change. The program elements would comprise, in turn, a cluster of *program activities.* These would ordinarily be individual projects or groups of closely related projects. (A tentative listing of prospective program activities appears on pp. 61–97).

The four program areas would differ in the priority and support assigned to each, in the criteria and methods for program design, and in the range of R&D activities involved. They would require different internal organizational structures for their appropriate management.

What would the NIE's organization be?

The NIE would be:

A *separate agency* within HEW,

Parallel to the OE,

Reporting to the Secretary of HEW through his designee, and

Led by a *Director* at Executive Level V, like the Commissioner of Education at present.

Its administration would be provided by:

The *National Advisory Council on Educational Research and Development*, which would assist in setting general policy, and

The *Director*, who would be responsible for continuous administration of the Institute's policies and programs.

The internal structure of the Institute would correspond to the structure of its programs. It would comprise:

A *Directorate of Programs*, headed by an Assistant Director for Programs, responsible for development and management of comprehensive national programs that address major educational problems (Program Area I),

A *Directorate of Research and Development*, headed by an Assistant Director for Research and Development, responsible for development and support of coherent, cumulative efforts to strengthen educational practice, the foundations of education, and the educational R&D system (Program Areas II, III, IV),

A *Center for Educational Studies*, headed by an Assistant Director for Studies, responsible for conduct of a program of studies of the state of education, analyses of educational problems, and design and evaluation of R&D programs (Intramural Studies), and

The usual *staff functions* for administration and communication.

How would the NIE function?

The NIE's functioning may be best described in terms of its four major program areas and its intramural program.

PROGRAM AREA I: ALLEVIATING MAJOR EDUCATIONAL PROBLEMS

The first priority of the NIE would be to organize, support, and carry out *comprehensive national programs* (combining research, development, experimentation, evaluation, and implementation activities) attacking major educational problems. It would devote a major portion of its resources—on the order of 50 percent—to this program area.

Illumination of the nature of education's crucial problems would be a major function of the NIE; the intramural R&D activity would play a central role in this process. However, that illumination has not yet been performed, so an adequate definition of problems warranting national R&D efforts does not exist. Thus, the following exemplars of problems to be addressed must be viewed as preliminary and tentative:

The poor education received by the disadvantaged,

The inadequate quality of the education received even by those from more comfortable backgrounds, and

The need to use education's limited resources more effectively.

Certainly, these problems would have to be narrowed and sharpened before comprehensive R&D programs addressing them could be developed.

To help solve these major educational problems the NIE would want to do two things: first, bring to bear in a coordinated way all that is already known or developed that might help in resolving the problem; and second, focus careful effort on learning and developing what is needed to provide better solutions.

Central management of each program element would be provided by an NIE *program task force*, led by a *program manager* and advised by an *advisory panel* of educators, R&D personnel, and laymen. The staff of the task force would comprise not only permanent problem-oriented R&D management personnel, but also personnel seconded from those parts of the NIE concerned with support of work on educational practice and foundations. They would bring to the problem task forces an awareness of the state of the art in their areas of concern, and would take back to those areas an enhanced appreciation of the needs of the educational system.

PROGRAM AREA II: ADVANCING EDUCATIONAL PRACTICE

The NIE would commit a significant portion of its resources—up to 25 percent—to *continuing, cumulative programs* intended to advance the practice of education in its artistic, scientific, and professional aspects. These programs would attempt to do those things that offer the best hope of moving the state of the art forward. The acivities would be carried out in many settings, would be less tightly linked together than the components of a problem-focused program element, and would provide both near- and farther-term returns.

This area would be concerned with the instructional process (content and methods), the educational system (forms of education and their administration), educational assessment, and the education of educational personnel.

Management would reside in a *Division of Educational Practice* within the Directorate of R&D. Because of the continuing nature of these concerns, each one could be the responsibility of a separate *National Center*, led by a *Center Director*,

and advised by a *Center Advisory Group* drawn from those distinguished educators and scholars with a direct interest and competence in the Center's area of concern.

The staff would comprise both permanent members and a number of educators or scholars serving temporary tours. To facilitate the exchange of information between problem-oriented and practice-oriented R&D, Center staff members would serve—part-time—on problem task forces.

PROGRAM AREA III: STRENGTHENING EDUCATION'S FOUNDATIONS

The NIE would invest a stable proportion of its resources—perhaps 10 to 15 percent—in a *portfolio of programs* intended to strengthen educational foundations in the sciences and technologies.

Educational practice and the solution of educational problems are rooted in an understanding of the *individual* as a learner, *group processes* and how they affect learning, *society* and its relation to learning, and the *technology and media* useful in instruction. These would be the central concerns of this area.

Management resposibility would reside in a *Division of Educational Foundations* within the Directorate of R. & D. Each subject of concern would be associated with a *Program of Studies* headed by a program director, and relying heavily on review panels drawn from the scientific community for assistance in program development.

Staff would be both permanent and short-term. Many of them would serve part-time, on problem-oriented task forces.

PROGRAM AREA IV: STRENGTHENING THE R&D SYSTEM

The NIE would devote a portion of its resources—say 10 to 15 percent—directly to the development of the R&D performer community through fellowships, institutional grants, and similar mechanisms.

Among the constituents to which it might want to devote attention are R&D manpower, R&D institutions, the linkages between *R&D* and practice, and information transfer within the R. & D. system.

Management responsibility for this area would reside in *a Division of R. & D. Resources* within the Directorate of R&D. Each constituent would be the responsibility of a *program* headed by a *program director*. The program professional staff would comprise permanent members primarily. Care must be taken to coodinate these programs with those of other parts of the NIE so that manpower and institutional programs respond to actual needs.

INTRAMURAL PROGRAM—CENTER FOR EDUCATION STUDIES

The NIE would devote a small portion of its resources—say 5 percent—to an intramural R&D program that would undertake careful study of educational problems, practices, and R&D. The intramural program would bring together permanent staff and a large number of 6-month to 2-year visitors from the education and R&D communities and othes with a deep interest in education.

Management would be provided by a *Center for Education Studies*. The internal organization of the center would not be so formal as that of the directorates. The basic unit of activity would be the *project*, each led by a *project leader* and varying in intensity from one man part-time to a dozen or more men full-time. An *Education Studies Board* would advise on the selection of visiting staff and on the program of studies.

Temporary staff would be drawn from other Directorates of the NIE, other Federal agencies, Fellows—both junior and senior—who come full-time for a fixed period, and Associate Fellows—both junior and senior—who are associated with the Center part-time for a fixed period.

Major themes of work at the Center would include illumination of major educational problems, evaluation of educational evaluations, examination of educational goals, evaluation of educational policies, and review of the state of education R&D.

ACKNOWLEDGEMENTS

The preliminary plan for the NIE that appears in thies report owes much to the suggestions and comments of the many people consulted during the study effort. Their ideas have been adopted, sometimes modified, merged, and occasionally extended to produce the NIE plan presented here. It has been impossible to

acknowledge the contributions of each individual. Instead, their names have been listed in Appendix C, although the major contributions of several are inadequately conveyed by that listing. A draft of this report was distributed to over 450 people in the government, educatinon, and R&D communities. More than 150 letters of comment were received in return. The names of those who replied also appear in Appendix C. The report has been greatly improved as a result of their comments.

Throughout the study, two members of the Planning Study staff, John Wirt and David Mundel, have been of considerable assistance. Both prepared early drafts of material that appears in this report. John Wirt is the author of Appendixes E, F, and G. David Mundel assisted in developing the program elements. The report has also benefited greatly from the assistance and commentes of John Mays of the Office of Science and Technology, Executive Office of the President.

I. Introduction

WHY A NATIONAL INSTITUTE OF EDUCATION?

American education faces severe problems. Despite a proud record of achievement in expanding educational opportunity, symbolized by the enrollment of half the college-age population in higher educational institutions, grave difficulties remain.

The expansion of educational opportunity has occurred unequally, bypassing many children born into social or economic disadvantage. Even the more privileged too often find education at all levels joyless, inappropriate, or ineffective. Educational institutions, from school districts to universities, face severe financial crises. Yet, even where sufficient resources are available, too little is known to assure their effective use. Many schools and campuses suffer the disruption of learning by individual and group acts of violence. Partially as a consequence, there are conflicting pressures throughout the education system to redistribute the powers of educational goverance. Clientele currently ill-served by the formal educational system are demanding their full share of its attention. At the same time, television and other powerful nonschool sources of education are rarely turned to the effective service of any educational clientele. The problems are severe indeed.

But the aspirations are high as well; Americans continue to expect much from their educational system. It should convey to members of the coming generation the knowledge and values of the previous one; develop in them the capacity to increase knowledge and strengthen values; and inspire among them the will to use that knowledge in the service of their values. It should prepare its students to adapt to life half a century into the future, in an age when fifty years spans several technological and social millenia, and offer them the opportunity to renew their skills and themselves throughout their lives. It should equip its graduates to be effective contributors to society, to be intelligent consumers, to be wise voters, and to be understanding parents. And it should do all this for children of poverty and neglect, as well as for those of comfort and care, while the vocational needs of the economy are changing, society's structure and values are shifting, technology and science are reshaping the physical world, and the fund of knowledge to be conveyed is building at an ever-expanding rate. The aspirations are high indeed.

To alleviate its problems and achieve its aspirations, *American education, at all levels and in all forms, must undertake a continuous program of improvement and reform.*

How Can Improvement and Reform Be Achieved?

Improvement and reform of American education requires efforts of many kinds: new forms of education must be designed, personnel must be better trained and selected, institutions must be reshaped, curricula must be revised, instruction must be refined. But there are many impediments to these efforts. In some cases, desirable change is impeded by lack of funds. In some cases, tradition or institutional inertia blocks the way. In still other cases, there is no one to catalyze the necessary change. But in a great many cases, there is simply not enough known to point the way to desirable change: we do not know enough about how to design new forms of education; train and select educational personnel more effectively; reshape institutions so that they become more flexible and responsive; develop and introduce contemporary curricula into the schools; or make instruction at all

levels more personal and adaptive. Nor do we know enough about how to obtain the funds essential to change; overcome resistance to useful change; develop agents of change; or provide the best current knowledge to those who need it to bring about change. *Lack of knowledge is a major impediment to achieving improvement and reform of American education.*

Knowledge may be acquired in two ways: it may be the result of the random and casual process through which most institutions and individuals learn from their experiences—trial and error; or it may be a product of the interrelated and disciplined procedures by which scholars, scientists, and technologists gain information and use it—research and development. R&D has greatly expanded our knowledge of physical and biological phenomena and our ability to adapt those phenomena to our purposes. While random and casual processes of learning about education will continue, they are insufficient. *Educational R&D is necessary to gain the knowledge needed for educational improvement and reform.*

What Can Educational R&D Provide?

Educational R&D cannot be expected to provide miracles or instant solutions. Its foundations in the behavioral and social sciences are still weak compared to the support that the physical and biological sciences provide health, agricultural, and industrial R&D. Moreover, educational processes and problems are extraordinarily complex and unyielding to simple study. Consequently, the time required to comprehend an educational process or develop a product is years, sometimes decades. Nevertheless, educational R&D can be expected to provide assistance and continuing improvement to educational practice. Certainly, the best of current knowledge and its applications must and can be made available for use in the schools and in other educational situations. And equally certainly, the fund of knowledge and its useful applications must grow at a rate consonant with the needs of education.

While educational R&D is unlikely to produce a learning pill or a motivating potion, it can produce important improvements and point the direction to reform. Here are some examples, from among many, of what a vigorous and effective R&D system could reasonably be expected to provide:

A continuously growing understanding of the educational process, which over the course of years changes the way we think about and conduct education (for example, an unraveling of the biological bases of memory that suggest new modes of learning and teaching).

Contemporary, interesting curricula, continually renewed, in most fields of learning (for example, development of a curriculum that draws upon literature, drama, and film to enrich the students' comprehension of what is unique in human affairs: individual lives, individual events, and individual relationships).

An expanding variety of forms of education designed to provide many more individuals with educational opportunities adapted to their needs and life-styles (for example, design of postsecondary education that extends through an individual's lifetime; is not tied to particular institutions, places, or degree structures; and serves both career and personal needs).

Objective information about the strengths and weaknesses of American education (for example, a description of the extent and nature of disorder in schools and on campuses, analysis of its likely causes, and examination of the effectiveness of the programs that have been tried to prevent it).

Better understanding of the prospective benefits and costs of Federal, state, and local educational policies before decisions are made (for example, data-based estimates of the prospective impact of possible forms of Federal aid to higher education on each of higher education's principal goals, categories of institution, and groups of students).

Plans for comprehensive educational programs, combining institutional, personnel, curricular, and instructional changes, carefully developed to meet major educational needs (for example, design and evaluation of a system of urban education extending from preschool through adult education that employs community television, storefront learning centers, and local tutors to provide each resident with education adapted to his needs).

While these examples indicate what educational R&D can provide, they are only a small sample. Adequately supported, R&D can, over time, help to improve every aspect of American education, in schools and out. *The investment in building a strong educational R&D system will be repaid many times over in benefits to American education.*

Why Have the Potential Benefits of Educational R&D Not Been Achieved?

Of course, some investment in educational R&D has already been made. Research on American education has been under way since the 1890s, when Joseph Meyer Rice tried to relate the practices of teachers to their students' performance. However, significant national investment did not begin until the mid-1950s, when first the National Science Foundation and then the Office of Education began to fund curriculum development and a wide range of research activities. Nevertheless, the sums provided have been relatively small. Even now educational R&D receives only slightly more than $200 million annually and occupies the talents of fewer than 10,000 R&D personnel. This is tiny compared to the size of the educational enterprise, which contributes over $70 billion to the GNP, employs over 3 million personnel, and engages about 60 million students. The investment in R&D is only 0.3 percent of operational expenditures in education.

Health and agriculture, which each contribute about as much as education to the GNP, invest considerably more in R&D than does education. In health, the annual R&D expenditure from all sources is almost $2.5 billion—4.6 percent of the nation's total expenditures on health care. In agriculture, the annual R&D expenditure is over $800 million; that is, slightly over 1 percent of agriculture's contribution to the GNP. Moreover, if education were ranked among the major industries according to R&D expenditures, it would stand in thirteenth place, just below the stone, clay, and glass products industry, and far below the $5.6 billion R&D program of the aircraft industry or the $4.2 billion R&D program of the electrical equipment industry.[1]

Of course, the comparison with health, agriculture, and industry cannot be used by itself to demonstrate the need for more funds for educational R. & D. Educational R. & D. is not as fortunate as those areas with regard to the solidity of its scientific base, the demand for and acceptance of innovation by its users, or the ability to measure and display improvement. Nevertheless, the comparison is valuable because it indicates the scale and cost of reasonably successful R. & D. activities in other major enterprises of no greater complexity or challenge than education. If the current record of educational R. & D. is to be judged, as it often is, in comparison with the well-known successes of health, agricultural, or industrial R. & D., then the difference in size must be weighed in the judgment. It is useful to remember that since 1950 over $14 billion has been invested in health R. & D. by the Federal government alone, over $7 billion has been invested in agricultural R. & D. but less than $1 billion has been invested in educational R. & D.

Against this background, the inability of current educational R. & D. to satisfy the needs of education for knowledge to guide improvement and reform becomes understandable: the educational R. & D. system is very likely too small. However, its smallness has been exacerbated by other difficulties. The reputation of educational R. & D. has been relatively low; individuals of the competence (on the average) found in industrial or health R. & D. have not often enough been attracted to work on the problems of education. The scientific base of educational R. & D. has been narrow; psychology has provided most of the basic concepts and techniques. The focus of educational R. & D. has been diffuse; small projects asking small questions with small cumulative effect have predominated. The linkage between educational R. & D. and the education system has been weak; little output of R. & D. has found its way to the classroom and not many classroom problems have been solved through R. & D. Teachers and administrators have been too rarely involved in the quest for new educational knowledge and its use. Finally, the support for educational R. & D. has been unstable; rapid changes of staff and priorities in Federal agencies have caused frequent fluctuations of emphasis.

Thus, *if the potential benefits of educational R. & D. are to be achieved, the educational R. & D. system must be strengthened.*

How Can Educational R. & D. Be Strengthened?

Building a vigorous and effective educational R. & D. system, capable of supporting the improvement and reform of American education, will require action to overcome each of the difficulties cited earlier. Improvement must occur with respect to six major characteristics of educational R. & D.

[1] Figures for industrial R&D come from *Industrial Research*, January 1971, pp. 36–38.

1. *Size.*—The national investment in educational R. & D. must grow to a size consistent with educational needs. (A preliminary target might be 1 percent of total educational expenditures. The rate of growth, however, will necessarily be determined by the R. & D. system's capacity to develop competent personnel, effective institutions, and programs of high quality and value.

2. *Stature.*—The place of educational R. & D. in government and in public and professional respect must be raised to a level comparable to that of other major national R. & D. enterprises. The rise in position within government is the more easily achieved; however, if it is accompanied by other improvements, it is likely to contribute as well to the rise in public and professional respect. Both effects will enhance the attractiveness of educational R. & D. to the competent professionals whose contributions will, in the end, determine the real stature of educational R. & D.

3. *Personnel.*—Educational R. & D. must engage the efforts of highly qualified personnel from a wide range of intellectual backgrounds. Ways must be found to conjoin their diverse knowledge and skills in investigations of educational phenomena and development of educational products.

4. *Focus.*—The efforts of the educational R&D community must be linked into activities of critical size that address issues of high scientific or practical consequence. Areas for focused effort, however, should be determined by careful analysis and consultation with advisory groups representing the appropriate constituencies.

5. *Implementation.*—The educational R&D and operating communities must be linked more closely if the products of R&D are to serve the real needs of education and be implemented. This is by far the most critical problem of educational R&D and should be the subject of extensive and varied efforts; without improvement in this area, all else will eventually fail.

6. *Stability.*—Educational R&D must develop and maintain multiyear cumulative programs that address critical educational issues.

The action to overcome these difficulties, however, cannot be taken by the educational R&D community alone. It must be encouraged and facilitated by the major influence on educational R&D, its principal source of funds—the Federal government.

Over 85 percent of educational R&D funds are provided by the Federal government. How much Federal money is spent, how well, where, and for what, strongly affect the direction and quality of educational R&D. Thus, *strengthening educational R&D must begin with the strengthening of Federal support and leadership.*

How Can Federal Support and Leadership Be Strengthened?

Two things are necessary to achieve strong Federal leadership and support of educational R&D: wise management and sufficient funds. But as a practical matter, neither wise managers nor sufficient resources can be attracted and employed to best effect in the absence of the proper institutional framework. Thus, the characteristics of the principal Federal agency supporting educational R&D are of central importance. To strengthen educational R&D will require an agency with the following characteristics:

Position within the government comparable to that of such agencies as the National Institutes of Health, National Bureau of Standards, and National Science Foundation. This position is necessary if it is to achieve leadership among the several Federal agencies that support educational R&D and if it is to provide a strong voice for increased support of educational R&D within the Executive Branch and before Congress. Heightened institutional position and visibility would also have the effect of raising the stature of educational R&D among the public, the educational community, and the R&D community.

An active advisory council, broadly representative of the education and R&D communities and the public, to help the agency develop its policies and programs. The council would help to assure that the Federal governments' support of educational R&D activities reflects the needs and has the support of the several constituencies. It would also advise on the choice of areas of focus and help maintain stable support for multiyear programs.

An internal R&D activity, of high competence, concerned with illuminating the major issues facing American education and identifying promising direction for educational R&D. The internal R&D activity would conduct

the analyses the agency will need in order to define appropriate areas in which to focus resources. It would also be the site for interdisciplinary studies by teams comprising both permanent staff and short-term visitors from education and R&D organizations. The existence of high-quality internal research would establish a climate of intellectual challenge and concern for education that should help to attract first-class R&D personnel to the agency, both for internal research and for the management of external research.

A flexible personnel system, modeled on those in other Federal R&D agencies, such as the NSF and NIH. The personnel system should enable it to hire competent staff from many disciplines and backgrounds in competition with universities, industry, and other R&D agencies and to provide short-term positions—as Fellows—for those who plan to spend most of their careers in other settings.

Authority, similar to that held by other Federal R&D agencies, to carry over unexpended funds from one year to the next. The funding authority would permit it to provide stable funding for multiyear R&D programs.

The principal agency for Federal support and leadership of educational R&D at present is the National Center for Educational Research and Development (NCERD) within the Office of Education. As currently authorized and constituted, it has none of these characteristics. *Thus, the conviction has developed in recent years that the best way to strengthen Federal support and leadership for educational R&D is to supplant NCERD with an agency having the necessary characteristics.* The result has been the proposal for creation of a *National Institution of Education.*

THE PROPOSAL TO CREATE THE NIE

The President proposed creation of the National Institute of Education in his *Message on Education Reform* of 3 March 1970. He described it as "a focus for educational research and experimentation in the United States. When fully developed, the Institute would be an important element in the nation's educational system, overseeing the annual expenditure of as much as a quarter of a billion dollars."[2] At the same time, the Department of Health, Education and Welfare submitted legislation to authorize creation of the NIE.

The President's proposal culminated a sequence of related recommendations that began over a decade ago. In 1958 an advisory board organized by the National Academy of Sciences-National Research Council (NAS-NRC) proposed such an institute,[3] to be comparable to the National Institute of Mental Health. The advisory board elaborated the proposal later in the year.[4] It called for the establishment of an Organization for Research in Education to conduct and sponsor educational research. But the proposals "fell on deaf ears."[5] Several years later, in 1964, enlarged Federal support for educational R&D and "new institutional arrangements . . . for the initiation and management of new research programs and for the dissemination of results" were urged in a report of the Panel on Educational Research and Development of the President's Science Advisory Committee.[6]

More recently, Dean David Krathwohl, of the School of Education at Syracuse University, proposed the development of National Institutes of Education on the model of the NIH.[7] The same suggestion became one of the major recommendations made in the 1969 report of the *Commission on Instructional Technology,*[8] chaired by former Commissioner of Education Sterling McMurrin.

[2] *Message on Education Reform,* President Richard M. Nixon, March 3, 1970.

[3] *Psychological Research in Education,* Advisory Board on Education, National Academy of Sciences-National Research Council, Washington, D.C., 1958.

[4] *A Proposed Organization for Research in Education,* Advisory Board on Education, National Academy of Sciences-National Research Council, Washington, D.C., 1958.

[5] Cronbach, L. J., and Suppes, P. (eds.), *Research for Tomorrow's Schools,* The Macmillan Company, New York, 1969, p. 10.

[6] *Innovation and Experiment in Education,* Report of the Panel on Educational Research and Development of the President's Science Advisory Committee, U.S. Government Printing Office, Washington, D.C., 1964.

[7] Krathwohl, D. R., *Educational Research: Perspective, Prognosis and Proposal,* Presidential Address, American Educational Research Association, Los Angeles, February 6, 1969.

[8] *To Improve Learning,* Commission on Instructional Technology, Printed for the Committee on Education and Labor, House of Representatives, U.S. Gvernment Printing Office, Washington, D.C., 1970.

Because they respond to the same set of circumstances that led the Administration to propose creation of the NIE, these two proposals deserved careful examination. They are reviewed in Appendix A.

The President's Message on Education Reform

The President's Message on Education Reform describes the *need* for a national agency concerned with educational research and experimnetation; provides information about the *nature* of the proposed Institute; and indicates six *topics* to which the Institute would be expected to turn its attention.

Need.—"As a first step toward reform, we need a coherent approach to research and experimentation. Local schools need an objective national body to evaluate new departures in teaching that are being conducted here and abroad and a means of disseminating information about projects that show promise."

"The purpose of the National Institute of Education would be to begin the serious systematic search for new knowledge needed to make educational opportunity truly equal."

Nature.—While the proposed legislation contains the basic description of the Institute, the President's Message provides some additional information about its nature:

"The National Institute of Education would be located . . . under the Assistant Secretary for Education."

It would have a "permanent staff of outstanding scholars from such disciplines as psychology, biology and the social sciences, as well as education."

"While it would conduct basic and applied educational research itself, the National Institute of Education would conduct a major portion of its research by contract with universities, nonprofit institutions and other organizations."

"The Institute would set priorities for research and experimentation projects and vigorously monitor the work of its contractors to ensure a useful research product."

"It would . . . link the educational research and experimentation of other Federal agencies—the Office of Economic Opportunity, the Department of Labor, the Department of Defense, the National Science Foundation and others—to the attainment of particular national educational goals."

". . . the 1971 budget increases funds for educational research by $67 million to a total of $312 million. Funds for the National Institute of Education would be in addition to this increase."

Topics.—In the course of his Message, the President identified six topics to which the NIE is expected to turn its attention:

1. *New Measures of Achievement.*—"To achieve . . . fundamental reform it will be necessary to develop broader and more sensitive measurements of learning than we now have."

"The National Institute of Education would take the lead in developing these new measurements of educational output. In doing so it should pay as much heed to what are called the 'immeasurables' of schooling (largely because no one has yet learned to measure them) such as responsibility, wit, and humanity as it does to verbal and mathematical achievement.

"It would develop criteria and measures for enabling localities to assess educational achievement and for evaluating particular educational programs, and would provide technical assistance to state and local agencies seeking to evaluate their own programs."

2. *Compensatory Education.*—"The most glaring shortcoming in American education today continues to be the lag in essential learning skills in large numbers of children of poor families."

". . . the best available evidence indicates that most of the compensatory education programs have not measurably helped poor children catch up."

"The first order of business of the National Institute of Education would be to determine what is needed—inside and outside the school—to make our compensatory education effort successful."

3. *The Right to Read.*—"Achievement of the right to read will require a national effort to develop new curricula and to better apply the many methods and programs that already exist. Where we do not know how to solve a reading problem, the National Institute of Education would undertake the research. But often, we find that someone does know how, and the Institute would make that knowledge available in forms that can be adopted by local schools."

4. *Television and Learning.*—"Our goal must be to increase the use of the television medium and other technological advances to stimulate the desire to learn and to help teach."

"The technology is here, but we have not yet learned how to employ it to our full advantage. How can local school systems extend and support their curricula working with local television stations? How can new techniques of programmed learning be applied so as to make each television set an effective teaching aid? How can television, audio-visual aids, the telephone, and the availability of computer libraries be combined to form a learning unit in the home, revolutionizing 'homework' by turning a chore into an adventure in learning?"

"The National Institute of Education would examine questions such as these, especially in the vital area where out-of-school activities can combine with modern technology and public policy to enhance our children's education."

5. *Experimental Schools.*—The experimental schools program, designed "as a bridge between educational research and actual school practices," would become the responsibility of the NIE.

6. *Early Learning.*—The experimental units of the Early Learning Program, working with the National Institute of Education, will study a number of provocative questions raised in recent years by educators and scientists:

The "awesome" difference in language and number competence between lower- and middle-class children at the time they enter first grade: What does this mean for compensatory education?

The decline in I.Q.'s of poor infants between 14 and 21 months and the ability to forestall it by skillful tutoring during their second year: How should this affect education of the very young?

The belief that the best opportunity to improve the education of infants under the age of three lies through working with their mothers: What might be done to communicate the latest information on child development techniques to these mothers?

NIE Legislation

The "National Institute of Education Act" was first introduced in March 1970 in the House and in the Senate. The Ninety-First Congress adjourned before it could be acted upon. A somewhat revised version of the bill has been introduced in the Ninety-Second Congress. It provides the following major features for the NIE:

Purpose.—The purpose of the NIE is to conduct and support educational research and disseminate educational research findings throughout the nation; also, to train individuals in educational research, promote the coordination of such research within the Federal government, and construct or provide for necessary facilities.

"Educational research" is defined to include research, planning, surveys, evaluations, investigations, experiments, developments, and demonstrations in the field of education.

Location.—The NIE is to be a separate agency, equivalent to the Office of Education in status, within the Department of Health, Education and Welfare.

Director.—The Director will be appointed by the President and confirmed by the Senate. He will be at "Level V" in the Federal Executive Schedule—equivalent to the rank now held by the Commissioner.

Personnel.—Professional and technical personnel could be appointed and compensated without regard to the provisions of the Civil Service System, as deemed necessary by the Secretary to accomplish the functions of the Institute. (This provision is modeled on similar authority held by the NSF.)

Advisory Council.—The Institute would have a National Advisory Council on Educational Research and Development consisting of 15 members appointed for staggered three-year terms by the President. The Council would advise the Secretary of HEW and the Director of the Institute on the status of educational research in the United States and on matters of general policy arising in administration of the NIE Act; make recommendations to them on strengthening research and dissemination of research findings; and present an annual report on the current status and needs of educational research in the United States to the Secretary, for transmittal to the President.

The Council could employ its own staff without regard to the provisions of Civil Service and could enter into contracts for studies necessary to the discharge of its duties.

Funds.—Funds provided to the NIE under the continuing authorization in the NIE Act would remain available until expended. This means that funds appro-

priated by the Congress for a particular fiscal year would not have to be spent within that year or returned to the Treasury; they would remain available for use by the Institute in subsequent years.

General Provisions.—The NIE is authorized to utilize the services and facilities of other Federal, public, or private nonprofit agencies; to make payments in installments; to accept gifts and voluntary services; to transfer funds or to accept funds from other Federal agencies for purposes authorized by the Act. It is also required to abide by certain labor standards.

PLANNING FOR THE NIE

There is considerable agreement among the several proposals for a National Institute (or Institutes) of Education on various features: location within the Department of HEW; separation from the Office of Education (OE); conduct as well as support of development, in addition to research; and concern with the problems facing American education. There is possible disagreement on whether the NIE should be singular or plural when it begins. But an even larger set of questions exists on which there is neither agreement nor disagreement, since the proposals have not explicitly attempted to answer them:

How shall the Institute(s) be internally organized?

With what levels or kinds of education shall the Institute(s) be concerned?

By what procedures shall the advice and counsel of those in the education community be obtained?

What steps shall be taken to achieve a successful beginning for the Institute(s)?

There are many other similar questions. Some cannot be answered until the Institute is authorized by the Congress, comes into existence, acquires a Director and a staff, develops a program, and gets to work. Some, however, must be answered in order for it to come into existence. To answer those questions, the Department of HEW has sponsored a planning study. This report presents the findings of that study.

Conduct of the Planning Study

The planning study began by identifying the questions that needed to be addressed. These fell into five categories:

1. *Objectives:* What should the principal objectives of the NIE be?
2. *Program:* What program activities should the NIE undertake? How should the choice of program activities be made?
3. *Organization:* What should the internal structure and management procedures of the Institute be?
4. *Relations to Other Parts of the Education System:* How should the NIE relate to other Federal, state, local, and private agencies concerned with education?
5. *Initial Activities:* What early activities will give the NIE the best chance of success?

A list of more specific questions in each category appears in Appendix B.

Several sources were employed to help develop answers to the questions. The first, and most important, was wide consultation with individuals in education and research whose experience has provided them with knowledge and insight about the issues being considered. This consultation initially took the form of individual discussions and, more usually, participation in group discussions at conferences organized to discuss the NIE. At the end of October 1970 a preliminary draft of this report was presented to HEW. During November briefings and discussions were conducted throughout the government. Early in December the draft was circulated to over 450 individuals in education and R&D representing a wide range of interests. About 150 letters of comment were received in response by mid-January. These letters were used to guide the revision of the draft. This report is the result.[9]

The second source was examination of comparable research organizations, such as NIH and NSF, for lessons from their experience that might be applied in the planning for NIE. The existing OE agencies concerned with educational research, especially the NCERD, were also examined so that their experience might be taken into account.

[9] A list of the individuals and groups contacted, of the presentations given and meetings held on various aspects of the NIE, and of those who provided letters of comment on the draft report is given in Appendix C.

A third source was the scholarly literature concerned with educational R&D, science policy, the management of R&D enterprises, and Federal science administration.[10] This literature, though still young, is a distillation of considerable experience about what is needed to develop and run an effective R&D organization. Its principal shortcoming, from the point of view of this study, is the fact that it has been developed primarily on the basis of experience with physical science and engineering activities. The nature of the behavioral and social sciences and educational R&D is sufficiently different from that of "hard science" activities that considerable care must be exercised in translating the lessons learned in the management of one to the other.

Continuing Planning for the NIE

Planning for the NIE is and must be a continuing process. Its first step produced the concept described in the President's Message and the accompanying proposed legislation. This study is the second step. Subsequent steps will occur during the Congressional hearings and after the Institute's formation and will continue as long as it retains the capacity to renew itself as circumstances change. This plan, then, should be viewed as part of a continuing evolution.

Planning for the NIE is also a complicated and delicate process. What the NIE becomes must, in the end, be determined by the needs of American education as identified by the Director and his staff, with the participation of the Institute's advisory groups and the Executive and Legislative branches of government. Too much specificity in planning might inhibit the capacity of the Director to build a truly effective and responsive Institute. Yet the Congress, the education community, and other interested parties must have a clear sense of the Institute's likely form and practice if they are to judge well its desirability. The present preliminary plan, then, attempts to strike a balance between these competing needs, to present one picture of what the NIE might become. It is more definite in those instances where the recommendations of those consulted were most in agreement. In other instances it suggests or provides examples, but indicates that specific choices should be deferred until the NIE is created.

During this planning study, then, the questions involved in the design of a viable and effective NIE have been discussed and examined from a number of points of view. This report attempts to convey the essence of those discussions, drawing them together, and framing a coherent, reasonably detailed picture of what the NIE might become. It is in no way considered to be final, however. Its primary role is to solicit the comments and reactions of concerned audiences. Please read it carefully and consider the National Institute of Education it portrays. What has been left out? What has been included that should not be? How might the proposed Institute be improved?

II. Objectives

The President's *Message on Education Reform* and the *National Institute of Education Act* state some objectives for the NIE. In the Message, there is emphasis on the need for "a coherent approach to research and experimentation" and "the serious, systematic search for new knowledge needed to make educational opportunity truly equal." The bill "declares it to be the policy of the United States to provide to every person an equal opportunity to receive an education of high quality regardless of his race, color, religion, sex, national origin, or social class." After noting that "inequalities of opportunity to receive high quality education remain pronounced," it states that "to achieve equality will require far more dependable knowledge about the processes of learning and education than now exists or can be expected from present research and experimentation in this field. . . . The Federal Government has a clear responsibility to provide leadership in the conduct and support of scientific inquiry into the educational process."

But, while these statements express the central concerns motivating the NIE proposal, they leave unstated much about purposes and priorities that must be known as the Institute is developed. Among the major questions about objectives for the NIE are the following:

Should the NIE be concerned only with the urgent problems of education, or should it support basic research as well? (The question is also asked in the inverse form, with "basic research" and "urgent problems" exchanging places.)

[10] A bibliography of the literature that proved useful in the course of the study is given in Appendix D.

Should the NIE be interested only in primary and secondary education, or should its interests extend to preschool and higher education?

Should the NIE consider the education that goes on outside of schools or limit itself only to te formal system of schooling?

Should the NIE focus its energies or spread them over the whole field of education?

Should the NIE provide continuity and stability of support for R&D, or should it be responsive to the changing priorities of education's politics?

Should the NIE direct R&D activities itself or respond to the interests and recommendations of researchers?

To permit these questions to be answered consistently, we have framed a statement of objectives for the NIE. The primary, overarching objective must be:

To improve and reform education through research and development.

To attain this objective, the NIE should undertake efforts directed toward four specific supporting objectives:

I. To help solve or alleviate the problems and achieve the objectives of American education.

II. To advance the practice of education as an art, science, and profession.

III. To strengthen the scientific and technological foundations on which education rests.

IV. To build a vigorous and effective educational research and development system.

These objectives are described in greater detail on the following pages:

PRIMARY OBJECTIVE: TO IMPROVE AND REFORM EDUCATION THROUGH RESEARCH AND DEVELOPMENT

What kind of improvement and reform? American education has achieved a striking record of sustained growth during the past 70 years. No matter how measured, access to education by Americans during that period has improved dramatically. In 1900, somewhat over 50 percent of school-age whites, but only 30 percent of nonwhites, were in school. By 1970, over 90 percent of both nonwhite and white school-age children were in school. In 1900, fewer than 5 percent of the 18- to 21-year-olds were enrolled in higher education; by 1970 the proportion had reached 50 percent.[1] In the last decade alone, resources devoted to education have more than doubled: $27 billion in 1960, $70 billion today; the number of students has increased by over one-fourth: 46 million in 1960, 59 million now; and the number of teachers and administrators has grown by almost 50 percent: 2.3 million in 1960, 3.4 million today.[2] *Almost one-third of America's citizens and almost one-tenth of our GNP are now devoted to education.*

Yet the lesson of the last decade has been that access to schooling is not enough. Despite the widespread availability of education, *equality of educational opportunity* still does not exist. Schools and school programs designed to serve the median American in town or suburb fail to motivate or educate the child brought up in urban ghetto or migrant labor camp. And the child who enters school with the disabilities caused by poverty and prejudice generally leaves as far behind as he started, only to begin anew the cycle that will see his children entering school under similar burdens. Even the town or suburban resident may find that the schools do not offer him an opportunity for education that will serve his career or personal needs, especially if he is not college-bound or if his desire for education develops after the age for formal schooling.

And despite the growth in school and college attendance, the *quality of American education* has not generally reached the standards desired by educators, students, and parents. For too many students, education must be taken like bitter medicine. The appetite for learning that most children possess is too rarely tempted in our schools. What is taught is often outdated or inappropriate to the needs of the age in which the students live. And the methods by which it is taught have been little affected by the new possibilities created by technology or the increased appreciation of the need to recognize individual differences in interest and capability.

Finally, despite the growth in resources allocated to formal education, knowledge of how to use *educational resources effectively* is still not adequate to en-

[1] Ferris, A. L., *Indicators of Trends in American Education*, Russell Sage Foundation, New York, 1969.
[2] *Saturday Review*, September 19, 1970, p. 67.

able educators, students, and voters to make the best possible use of the resources that are available. Certainly, more substantial and equitable means of financing education will have to be found if improvement is to occur in the equality and quality of educational opportunity. But the need to request additional resources only makes it more critical that education use wisely whatever funds, teachers, buildings, and students it has. Improvements in resource use can come from many places: hours that teachers waste on unnecessary bookkeeping or monitoring might be used to help students over difficulties; funds spent on elaborate equipment might provide simpler supplies for many more classrooms; buildings sitting vacant during evenings and vacations might serve other learners during those times.

Thus, "to improve and reform education" means to seek advances of three specific kinds:

Increased equality of educational opportunity,
Higher quality of education, and
More effective use of educational resources.

It is toward these goals that the NIE must set its course and against them that it must measure its progress.

What kind of education? Education in all settings, both within schools and outside of them, and of all Americans, before, during, and after the traditional school ages, should be within the scope of interest of the NIE.

Education has too often been torn by arbitrary divisions into levels or subjects or formats; if the NIE is to bring to education "a coherent approach" and "a serious, systematic search for new knowledge," it should not be unnecessarily hampered by conventional distinctions and artificial barriers. The NIE should be able to relate children's learning at home, in the streets, and from the TV screen to their learning in schools. It should be free to seek the consistent application of new knowledge to the learning process in all educational settings. And since a problem seeming to reside in one part of the educational system (say, elementary education) may be discovered upon study really to reside elsewhere (say, in teacher education), the NIE should have a broad enough charter to permit the thread of an educational problem to be followed across the educational fabric.

With finite funds and finite competence, the NIE will not be able to work on every aspect of education at once. The NIE will have to make choices, establish priorities, and choose its targets carefully. It will have to seek to do with its forces what seems most important and productive at the time. The NIE might, thus, concentrate initially on the early development and learning experiences of our nation's disadvantaged and devote relatively less effort in its early years to post-secondary education in the sciences and humanities or the needs of the gifted. But education's areas of severe need will shift as some problems are reduced, society's demands change, or previously hidden difficulties are perceived. And the NIE should be free to shift its attention in consonance.

By what means? The final phrase of this statement of the NIE's primary objective is "through research and development." The NIE will share its concern for the improvement and reform of education with many other agencies, including the OE. What will distinguish the NIE will be its concern with particular means to that end. By "research and development" [3] will be meant the entire spectrum of activities from reflective thought in the library, through careful laboratory experimentation, the design and testing of products, and large-scale field testing, to applied problem-solving in practical settings. The NIE's concern will be with the development, demonstration, and dissemination of knowledge, tested techniques, and products through which education can be improved. It must devote considerable attention to activities that assist in the implementation of its developments. However, the *widespread* introduction and use of these developments will remain the concern of other Federal, state, local, and private education agencies.

How should the NIE go about improving and reforming education through R&D? Should it

Focus its energies on solving *pressing educational problems?*
Devote its attention to *strengthening the processes and techniques of education?*
Concentrate on *basic research* to build a solid base of knowledge?
Seek to *build a vital R&D system?*

[3] Appendix E presents a more extensive discussion of the nature of educational R&D.

The consensus of those consulted during this planning study is that the NIE must pursue a mixed strategy; no single approach would be sufficient. All of these activities must be undertaken, not only separately but in close association and combination.

Basic research can be expected to produce new insights that, in the future as in the past, will lead to important improvements in education. But without the complementary problem-solving efforts that help to shape the questions to which research turns and that help to put the findings of research into practice, it will not achieve its full effect. Moreover, measured in terms of the ultimate criterion—improvement and reform in education—both strengthening the foundations of education and attempting to alleviate the pressing problems of education are effective investments. The former may have widespread and fundamental influences eventually, but its impact tends to come farther in the future; the latter may not have quite as great an influence, but the benefits tend to come sooner. Thus, a well-designed program should achieve both goals in a balance determined by estimates of eventual effect. And, by similar arguments, a well-designed program should devote some of its resources to sharpening the tools of education and to building the R&D community. Thus, to serve its primary objective, the NIE should have four supporting objectives, which define its multiple approach to improvement and reform of education.

SUPPORTING OBJECTIVE I: TO HELP SOLVE OR ALLEVIATE THE PROBLEMS AND ACHIEVE THE ASPIRATIONS OF AMERICAN EDUCATION

What kind of effort? The most direct way to seek improvement and reform in education is to make a concerted effort to overcome those educational problems that seem most pressing or to attain those objectives that seem most promising. Just as teams of scientists and engineers in other fields have concentrated efforts on conquering polio, or the corn borer, or the military forces of our adversaries, and on placing man on the moon, so might similar teams of researchers and developers address the "urgent pathologies"[4] and the vital goals of American education. Indeed, one of the most frequently heard charges against current educational R&D is that it has not concerned itself sufficiently with major educational problems and objectives.

The NIE should devote a major portion of its resources to comprehensive programs addressing specific problems and aspirations of American education. Some programs of this nature are describe in Program Area I of the tentative NIE program presented in the next chapter. These programs would have three purposes.

The first would be to *assure that the best of our current knowledge is brought to bear on current problems.* What is known now is not sufficient to cure most of those problems, but enough is known about many topics to do better than is being done. To begin with, then, the NIE should seek to identify, clarify, and make available the best current knowledge applicable to major educational problems. But more can be done.

The second purpose would be to undertake further *R&D efforts designed to extend our knowledge and capability* to resolve particular problems, even in the short run. These efforts would involve a closely linked series of projects of various kinds, all intended to help solve the problem under attack. Among the projects would be analyses of current practices to point the way to promising improvements; experiments designed to test and evaluate new approaches; product and curriculum developments to meet needs not being satisfied; laboratory research to improve understanding of important phenomena; other basic and applied research intended to define more clearly the nature of the problem; and a wide range of activities directed at putting the program's findings into practice.

The third purpose would be to *identify specific gaps and deficiencies in education's tools or foundation knowledge* whose elimination would lead to improved solutions to educational problems or better achievement in the future. By identifying those deficiencies, the program could shape the activities undertaken in the other parts of the R&D system so that in the future the needed knowledge and techniques will become available.

Thus the concentrated attack on a severe problem (or vital goal) of education is likely to include interwoven activities ranging widely across the spectrum of R&D, from evaluation of current practice through experimentation with new

[4] This phrase was suggested by Stephen Wright of the College Entrance Examination Board.

ideas and the development of improved curricula to basic research on education's foundations.

Which problems and aspirations? What are the deficiencies whose urgency is most compelling? To what problems should the NIE develop a coordinated approach? In health, the identification of a disease demanding attention has not been difficult; smallpox, polio, heart disease, stroke, and cancer are reasonably well-defined, widely spread problems, recognized in the public consciousness in terms not inconsistent with the way they are seen by the medical research community. In education, however there are no satisfactory characterizations of pathologies, no common vocabulary with which to talk about problems. Indeed, there is frequently disagreement about what is cause and what is symptom, about what is a soluable problem and what is an unfortunate situation inherent in the way things are. And the problems as defined in the headlines may not be the ones that deserve priority in an R&D program. Nevertheless, the NIE must begin by examining the problems as they are perceived by the public. From that examination will come the sharpened perception and heightened understanding that will define the problems on which the NIE should concentrate its resources. Here are some of the symptoms the NIE must examine:

> *Inadequate education of the disadvantaged.* Ghetto blacks, poor whites, Puerto Ricans in large cities, Chicanos, American Indians, and a number of other groups handicapped by low income prejudice, and low social status, leave the schools without achieving competence in such basic skills as reading, writing, and mathematics sufficient to assume a satisfactory role in the general society. In most cases they leave, as well, without acquiring the vocational skills needed to obtain a satisfying job. Frequently they leave feeling less, rather than more, a part of the society they will enter.

This complex of inadequacy has frequently been described as "the reading problem," as "the problem of bilingual education," as "the vocational education problem," or as "the problem of inadequate responsiveness by the schools to community needs." Under careful examination by the NIE, one of those aspects may indeed turn out to be central and deserving of greater effort than the others. In any event, *the NIE must devote itself to the pressing problem of improving the education of the disadvantaged.*

Other problems perceived by the public that the NIE might examine include:

> *Uninteresting and inappropriate education.* Many students throughout the educational system, from preschool to graduate school, still have their taste for learnnig deadened by dull teaching of useless or outdated topics in inflexible classrooms.
>
> *Insufficient attention to the needs of many clientele.* Teenagers who wish to go directly to work, women who want to resume education after raising their children, and adults who wish to continue formal education while working are rarely well-served by the educational system; their needs are met, if at all, through auxiliary institutions, underfunded and understaffed.
>
> *Inadequate use of extra-school educational opportunity.* Preschool, school-age, and postschool students can learn more through their experiences outside of school—via television, library, club, or job—than they do within it, yet those opportunities to learn are more often seized to sell or entertain than they are to inform or enlighten.
>
> *Disorder in the schools.* Students, instructors, and administrators in urban elementary and high schools, suburban high schools, and college campuses everywhere bring America's racial generational, and political conflicts into the classroom, tearing the social fabric of their schools.
>
> *Inappropriate forms of governance.* At each level of education, the traditional distribution of authority and responsibility among community, students, faculty, administration, and board is shifting under the weight of political and social forces, although there is little agreement about what distribution would be appropriate.
>
> *Inadequate financial support.* Voters, taxpayers, and legislators in city, suburb, and countryside have begun to withhold their previously generous support to educational institutions at all levels, questioning the effectiveness of the schools' performance, just when additional resources seem necessary, to increase their effectiveness.
>
> *Ineffective use of existing resources.* Teachers and professors, deans and principals, superintendents and presidents, school board members and trustees, taxpayers and alumni lack the information needed to bring about the most effective use of education's scarcest resources: hours to teach in, hours to learn in, and dollars to make those hours possible.

Difficulty in assessing results. Efforts to overcome these problems are hampered by the inadequacies of existing methods of identifying the range of outcomes of educational programs to those who must select among the—parents, students, teachers, administrators, boards, and legislators.

Difficulty in achieving improvement. Throughout the educational system those who seek improvement are constrained by inadequate budgets, unchangeable institutions, insufficient information, and unresponsive individuals or groups; the disincentives to change often outweigh the incentives.

But even more clearly here than in the case of the disadvantaged, these "problems" do not have the compelling clarity of biological disorders. They overlap, interact, and vary in significance. Terms like "ineffective," "difficulty," "inadequate," and "insufficient" describe extremely imprecise judgments, grounded in the intuition produced by headlines, rather than by the knowledge derived from careful analylsis of data. That serious problems exist in each of those areas there can be little doubt; what the nature and extent of the problems really *is* is far less certain. Thus, one of the NIE's most important functions is likely to be the "illumination" [5] of education's problems with sufficient brilliance to enable effective attempts at solution to be developed. *The analysis necessary to produce such illumination should be expected to be a continuing part of the process by which the NIE identifies and addresses the problems of education.* The intramural R&D staff of the NIE would devote a major part of its effort to this analysis.

With what limits? The NIE's attempt to develop practical solutions to educational problems will quickly encounter the limits of education's power.

First, many of the pathologies may arise from individual and societal deficiencies outside the responsibility of education. Second, resource limitations and statutory, contractual, or conventional constraints inhibit the ability of the education system to change. And third, the tools of education and understanding of the phenomena with which it deals are so crude—compared, say, to the techniques of medicine and the understanding of human physiology, genetics, and biochemistry—that many of the attempts at problem-solving will be seriously impeded. It will turn out often that evaluation techniques to measure deficiencies and meter progress will be missing; teaching strategies to achieve certain desired effects with particular groups of students will be absent; and knowledge about forms of schooling based on different conceptions of the role of education will be nonexistent. The range of alternative solutions to educational problems is severely constrained by the limitations of educational practice. Therefore, satisfying this objective of the NIE depends in a direct way on success in satisfying the next objective: advancing the practice of education as an art, science, and profession.

SUPPORTING OBJECTIVE II: TO ADVANCE THE PRACTICE OF EDUCATION AS AN ART, SCIENCE, AND PROFESSION

Educational practice has four aspects: instruction, administration, assessment, and the education of educators. Instruction concerns both what is taught and how. Administratiton establishes the organization and management of education. Assessment measures and evaluates the outcomes of education. The education of educators transmits educational practice to present and future practitioners. Current educational practice is deficient in each of these aspects; each must be advanced.

However, educational practice, unlike most practice in industry or agriculture, is not a highly technical process whose procedures and quantities can be adjusted scientifically until the outcome matches the desired result. Rather, educational practice is an individual and social process, highly influenced by the qualities of each practitioner and the needs and values of each community. Therefore, educational practice cannot advance solely as a science; it must also develop as an art, shaped by creative individuals; and as a profession, responsive to community needs and values.

The NIE should commit a significant portion of its resources to continuing, cumulative programs intended to advance the practice of education as an art, science, and profession. Some aspects worthy of effort are described below. Tentative program activities for the NIE in support of this objective are given in Program Area II in Chapter III, *Program.*

Teaching as an Art.—The art of teaching is still primitive, its masters generally known only to the small groups of students they have served. Appren-

[5] This term was suggested by Professor John Tukey, Princeton University.

ticeship and other more means of conveying the art to a new generation are rare. Study of the techniques and styles of great masters of teaching is rarer still. And there does not yet exist an esthetics of teaching that guides the description and criticism of the teaching process. There are good reasons for this, of course: teaching is a fugitive art, difficult to record; and it is an applied art, difficult to evaluate. The newer technologies, however, offer the opportunity to capture teaching on video tape, on film, or in computer programs, and some of the more creative of contemporary teachers have attempted to describe their teaching styles in books and articles. Students and teachers are becoming more conscious of the "style" of the learning experience. There now exists the opportunity to make significant advances in the art of teaching.

Education as a Science.—The science of education, despite its 80-year history, is still in its infancy. Were it mature, it might be expected to provide a substantial body of knowledge about the educative process that would permit the educator to measure the initial state of the learner; to match teaching method to teacher characteristics, learner characteristics, and content; and to assess the change in the state of the learner after being taught. Progress has been made in each of these areas, of course. Yet the tools of measurement are satisfactory primarily for basic cognitive skills. Knowledge of the appropriate methods of teaching for various learner groups is quite limited. Nevertheless, promising new approaches to the evaluation of noncognitive skills are being developed. Experiments with more carefully designed teaching methodologies are yielding more precise information about what works, under what conditions. Thus, the need and the chance to speed the development of scientific aspects of education exist.

Professional Aspects of Education.—In its professional aspects, education, like medicine and law, exists in a reciprocal relation with society. Because of their command of specialized knowledge, skills, and experience, professions are granted certain privileges by society in making decisions that affect the fortune or well-being of citizens. The profession's responsibility, in turn, is to establish the standards of professional preparation and practice that will assure the proper exercise of that trust. These aspects of education require considerable improvement.

The *education that teachers receive* is widely held to be deficient. It rarely combines first-class training, research, and practice in the same complex; consequently, teacher education is generally detached both from the frontiers of research and the forefront of practice. Established teachers can practice for 30 years without having to update or refresh their knowledge and skills. As eductional R&D grows and increases and potential rate of educational improvement, however, the need to strengthen the system of initial and continuing teacher education will grow even more crucial. Teachers are at the cutting edge of education; therefore, improving and reforming education depends, in large measure, on improving the education of teachers.

Education also bears a major responsibility in determining *what shall be taught*. In doing so, it should work with the community to help articulate the needs of society and of individuals within society. What, for example, should the elementary school provide its students in arithmetic skills to enable them to be successful consumers, workers, and citizens without further study? How will changes in the future, such as the widespread availability of computers, affect their needs for mathematical knowledge? Similar questions can and should be asked about each potential subject of study. Yet, education's efforts to review and renew what is taught are insufficient. In some areas, especially the sciences, successful new primary and secondary school curricula have been developed in recent years under the leadership of new participants in nonuniversity education—scholars at the forefront of knowledge in the subject area. However, curriculum reform has not yet widely affected many of the other central topics of education, such as the arts and humanities, studies of society and the economy, and career skills. Nor has a viable system of continuing curriculum renewal been created. The improvement of education demands such a system.

Education bears responsibility to society in two other ways. First, it should develop *forms of education* that satisfy the variety of needs that society has. Tradition, rather than creative response to needs, appears to have produced the narrow range of forms currently available. But technology and rapid social change have altered the conditions for which these forms were developed. Education should now take the lead in designing systems that will satisfy the developing requirement for education that continues throughout life, that breaks some of the barriers

between school and society, and that deploys technology creatively to broaden access to excellent education.

Second, it should develop *means of reporting on performance* and needs to its clientele and of responding more directly to their needs and desires. The current efforts to introduce "accountability" into the schools, to strengthen community involvement through decentralization of large systems, and to assess the effects of schooling through nationally administered tests are efforts in this direction. Much remains to be done to make them effective means to the desired ends. And much remains to be done in developing other means to those ends.

Educational practice rests on a foundation of knowledge about the psychology of learning, the anthropology and sociology of small groups, the art of television and film, the technology of computers, the statistical analysis of complex processes, and the economics of human capital, among others. Therefore, meeting the objective of advancing education as an art, a science, and a profession will be dependent upon the progress that is made toward meeting the next objective: strengthening the scientific and techological foundations on which education rests.

SUPPORTING OBJECTIVE III: TO STRENGTHEN THE SCIENTIFIC AND TECHNOLOGICAL FOUNDATION ON WHICH EDUCATION RESTS

Educational practice is rooted in an understanding of the *individual* and how he learns and grows; the *group* and how it motivates or inhibits the individual's capacities; the *society* and what it requires of its citizens and they of it; *technology* and how it can assist the process of instruction, and how instruction must account for technology's effects on society.

This understanding is formed, in part, of the "common sense" knowledge each individual develops through experience; in part, of the "received wisdom" of his preceptors and colleagues; and, in part, of the "disciplined knowledge" of scientists and scholars. In comparison with the foundations of the mechanical or electrical industries, of medicine or of agriculture, education's foundations rest far more on "common sense" and "received wisdom" and far less on "disciplined knowledge." The behavioral and social sciences have not yet reached the state of development attained by the physical and biological ones.

But the experience of those other areas suggests the benefits (and the dangers) to be expected as scientific understanding of the individual, of groups, of society, and of certain technologies is increased. Knowledge of physical processes and of biological processes has given us power over them and enabled us to direct them to our ends. Better knowledge of behavioral and social phenomena will confer similar power, for the benefit of education and other social ends.

The NIE should invest a stable proportion of its resources in long-term programs intended to strengthen education's foundations in the sciences and technologies. The prospective benefits are described below. Some tentative program activities of this kind appear in Program Area III in the next chapter.

The building of this knowledge is, for the most part, not a dramatic process. It depends on the disciplined inquiries of many, many investigators, each pushing his part of the frontier a bit farther forward. Occasionally, an investigator, especially favored with competence, preparation, or luck, will see how to break through the frontier and drive a deep salient into previously dark areas. But even then, the consolidation and thorough exploration of his salient will demand the disciplined energies of his many less-favored colleagues. Those who, like the educator, would use what is known, rather than extend it, frequently know and care little about this process. Their concern is with the map of the territory contained in the textbook and not with the travail of its explorers. Thus it is that basic research does not always exert a direct influence on the practice of education but does always exert an indirect influence through its shaping of the conceptions in which educational practice is rooted.

The effect of a changed conception, though perhaps not dramatic, can be quite widespread. In a recent brief paper [6] on the contributions of successful research to educational practice, Professor J. W. Getzels, of the University of Chicago, noted the following examples of "basic studies that have had manifest effects on ... aspects of the school enterprise."

> Thorndike and Woodworth's empirical studies demonstrating the fallacy of the doctrine of "formal discipline," which held that learning something

[6] Getzels, J. W., *Examples of Successful Research Related to Education*, informal paper, 1970.

"tough" like Latin or Greek was preparation for life to learn anything "easy," significantly affected what was taught in schools.

Terman's basic studies of gifted children showing that, contrary to popular belief, they are on the average better than their peers in physical development, emotional adjustment, and social maturity changed the attitudes held about gifted children and their educational needs.

Lewin, Lippitt, and White's study establishing the relationship between children's behavior and autocratic, democratic, or laissez-faire patterns of teacher leadership greatly affected teacher education and educational administration.

"Guilford's . . . research on the structure of intellect, which led to the notions of convergent and divergent thinking, [is] now increasingly a part not only of the assessment of children's ability but of the curriculum objectives in many schools."

"Skinner's basic research on learning and reinforcement . . . contributed heavily to the development of programmed instruction."

"Clark's basic research on self-concepts of Negro and white children [was] used by the Supreme Court in its desegregation decision."

"Hebb's basic research on the effects of sensory deprivation . . . raised important questions about the role of the early life of disadvantaged children on their later performance in school."

"Fantz's basic research on the perception of infants, during the first months of life . . . is altering the view that the infant's world is only a buzzing confusion, and is likely to influence the educative provisions in infant and child care centers."

"Piaget's basic research on cognitive development . . . is transforming our conceptions of the growth of intellectual functioning from linear to stage models, and is having significant effects on curriculum construction."

"Schultz's basic research on the economics of education . . . may alter the prevailing views that schools consume capital to the view that schools produce capital, and thus ultimately have a more profound effect on the financing of education than all the practical packages developed to sell school bonds put together."

Disciplined study of individuals, groups, society, technology, and the other foundations of education is the business of the traditional disciplines. What we know in a rigorous way about the individual as a participant in education comes from the work of the psychologist, biologist, linguist, anthropologist, and philosopher; the group is the subject of psychologists, sociologists, and anthropologists. Society and its institutions are explored by sociologists, anthropologists, political scientists, economists, linguists, historians, and philosophers. Technology is the province of the physical scientist, psychologist, engineer, economist, information scientist, and management scientist. Statisticians, mathematicians, and computer scientists provide some of the methods of study to each of these disciplines. Thus, the NIE should encourage work in the traditional disciplines that promises to strengthen the foundations of education.

These foundation-building activities, like those devoted to advancing education and to solving educational problems, depend on the availability of competent personnel to carry out the work, on the existence of suitable organizations to bring them together and support them in the performance of their tasks, and on managerial competence to allocate available funds effectively. At present, each of those resources is in short supply in education. Thus, the next—and last—supporting objective assumes special importance.

SUPPORTING OBJECTIVE IV: TO BUILD A VIGOROUS AND EFFECTIVE EDUCATIONAL RESEARCH AND DEVELOPMENT SYSTEM

To achieve the objectives just described will require the participation of an extensive and intricate network of research and development institutions and personnel. The NIE should occupy a central, influential role in this network, especially as a source of funds and as a means of bringing about coordinate activities among the many participants, but it will not be able to do even a small portion of the necessary work itself. It must rely upon the educational R&D system.[7]

Had it been designed by some single, far-sighted intelligence, that system might be expected to be the right size, to contain the proper distribution of skills

[7] Appendix F describes the participants in the educational R&D system.

and interests, to have developed appropriate institutional mechanisms for carrying out its tasks, and to have established satisfactory internal mechanisms for communication and quality control. Even if no single intelligence had designed it, but instead some long-term, incremental process of evolution had been allowed to operate, it might have been expected to achieve some close approximation to appropriate size and character through a process of natural selection. However, neither a single intelligence nor a long-term natural evolution has shaped the educational R&D system. It is, rather, the product of decades of indifference followed by a decade of forced expansion. Naturally, the form that it has taken satisfies few of the requisites for an effective system. Compared with the needs of education and the demands that will be placed upon it by the NIE, it is too small, too diffuse, maldistributed, too narrow in scope, and lacking in nonacademic institutions.

Too Small.—There is no precise rule by which the proper size of the educational R&D system could be determined. In the long run, proper size for an R&D system depends on the scope of the subject, the chances of success, the benefits to be expected, and the costs. In the short run, it is limited by the availability of personnel and by the state of knowledge. Decisions, however, can be made on simpler, incremental grounds: Should the system be increased, decreased, or kept the same during the next year or two?

Two informal arguments suggest that at this time the educational R&D system should be increased. The first argument is simply that, compared with the R&D system serving other national enterprises of similar size, no greater importance or need, and no less challenge, the educational R&D system is quite small. The previously noted comparison[8] with agriculture and health, both of which have benefited dramatically from R&D during the last several decades, is especially telling. It is reviewed in Table 1.

TABLE 1.—RESEARCH AND DEVELOPMENT EFFORT IN EDUCATION, HEALTH, AND AGRICULTURE (1968)

Area	Contribution to 1968 GNP (billions)	Expenditure for R. & D. (billions)	R. & D./GNP contribution (percent)	Effort devoted to R. & D. (equivalent man-years)
Education	$53.0	$0.190	0.3	4,500
Health	51.5	2.400	4.6	59,000
Agriculture	73.5	0.800	1.1	26,000

Although all three enterprises are large and of roughly similar size, agriculture spent 4 times the dollar resources and almost 6 times the manpower on R&D as did education; for health, the difference was even more dramatic—13 times the dollar resources and 13 times the manpower. Whereas agriculture allocated 1.1 percent of its contribution to the GNP to R&D, and health allocated 4.6 percent, education expended less than 0.4 percent. (The situation has not improved since 1968.) The starkness of these figures is emphasized by the relative recentness of education's rise to even that level. As recently as FY 1963, the OE—now the primary source of support for R&D—expended less than $10 million for R&D.

Thus, the comparison with enterprises of similar scope and no greater difficulty that have been greatly benefited by R&D suggested that the educational R&D system is still far below the size needed to contribute significantly to the improvement and reform of an enterprise of education's scope and difficulty.

The second argument is that there are tasks for educational R&D that are important and promise significant benefit, but are not being carried out by the current system because of inadequate resources. In the previous discussion of the NIE objectives, some such tasks were described in very general terms. In the next chapter, a program of activities for educational R&D will be described somewhat more specifically. Here it may suffice to note that currently very few of the local or state education agencies have access to R&D personnel or institutions who could assist with the major problems they face; that careful experimentation with comprehensive educational alternatives is rare; that the findings of R&D are not consistently put into practice; and that development of new practices, equipment, and curricula is still occurring at a very slow rate.

[8] Appendix G contains further information about this comparison.

Too Diffuse.—Scientists and engineers frequently refer to the need to achieve "critical mass" in an R&D enterprise. The term comes from nuclear physics, where the critical mass of radioactive material is the amount needed to achieve a self-sustaining nuclear reaction. It has come to mean the minimum size and composition of a research or development group necessary to achieve a vital, self-sustaining, creative atmosphere for the task at hand. In basic research, quite theoretical in character, the critical mass may be one or two researchers; in complex developmental and experimental programs, the critical mass may be several hundred individuals having a great diversity of skills. When the critical mass for larger tasks cannot be achieved, individual researchers tend to pursue small tasks on their own. These small tasks rarely cumulate to achieve major effects.

Another kind of critical mass is the one that increases the power of a large enough group of research teams, each pursuing its own topic within the same field at the same institution. The different points of view and approaches to the field come together both formally and informally, enriching the criticism and insights available to each, and leading to the formation of new teams, new approaches, and new points of view. Anyone who has experienced such an atmosphere is aware of the enhanced creativity and productivity it produces.

Educational R&D has suffered from a lack of R&D groups that have attained either kind of critical mass. The R&D Centers and Regional Educational Laboratories were established to achieve interdisciplinary R&D groups (in the first case) and development groups (in the second case) of sufficient size to be effective. Some of those 23 groups have begun to "go critical," but in total they are still a small portion of the system. Some schools of education have attempted to achieve development groups, but their aspirations have been hindered by lack of funds. The typical situation in education is still the one- or two-man research study, in which the participants engage part-time. There is a strong need to form larger critical masses of R&D personnel working on the central issues of education.

Maldistributed.—Related to the problem of attaining critical mass is that of achieving a proper distribution of effort among the activities from research through development to implementation. Insufficient effort in development and implementation will impede the application of increased knowledge in practice; not enough effort in research will inhibit effective development and implementation. More specifically, effective R&D systems, such as those that serve industry, health, and agriculture, have developed complex networks of activities linking research with practice and have staffed them with specialists such as design, production, and sales engineers, agricultural extension agents, and medical detail men. The educational R&D network, by contrast, is incomplete and imbalanced. What improvements there are have occurred during the last decade with the increase in funds from the OE and the NSF for development and implementation activities. Nevertheless, educational R&D still displays the consequences of its long isolation in the school of education: 60 percent of educational R&D funds were spent in universities and colleges in 1968, but only 37 percent of health and 22 percent of agriculture R&D funds were. Educational R&D is still heavily weighted toward the kinds of research and evaluation activity favored by such settings.

What are *underdeveloped* are the kinds of activity that in other fields are carried on by industry, agricultural experiment stations, and teaching hospitals. Education devoted roughly 3,900 man-years of effort to development and innovation in 1968; agriculture expended over 28,000 man-years.

What is *virtually absent* is the research-based problem-solving activity in the operating agency. In 1968 there were only 1,300 man-years of research, development, and innovation carried on in the almost 20,000 state and local education agencies; most of that was testing and gathering statistics.

If educational R&D is to be effective in improving the education of Americans, these maldistributions will have to be rectified.

Too Narrow in Scope.—Education is a many-sided subject. It impinges on every aspect of our lives—cultural, social, political, and economic; it draws upon most of our resources—human, technological, institutional; and it concerns all aspects of humanness—philosophical, psychological, biological. Education should, therefore, be a subject of interest to an exceptionally wide range of specialists, from political scientists and economists, through psychologists and engineers, to natural scientists and artists. And it should benefit from their contributions. It is, therefore, both surprising and disconcerting to observe that

education benefits far less from such concern than does defense or business—certainly far less than it should.

For a variety of reasons, rooted in history and academic status, educational R&D has been the almost private preserve of the psychologist and, occasionally, the sociologist. Only recently it is beginning to attract the attention of more than a handful of well-trained researchers in other fields. Economic, political, technological, biological, statistical, and linguistic aspects of education are becoming more respectable subjects of study within the relevant disciplines. But the trend is still young and it has serious impediments to overcome; it will need significant encouragement. Even more important, and more difficult, is the creation of incentives and institutions whereby these various disciplines can work together to bring their complementary talents to bear on significant educational problems.

Lacking in Institutions. If educational R&D is to grow in size, in concentration, in distribution, and in scope, it will have both to draw many more scientific and developmental personnel into its efforts and to provide appropriate settings in which they can work. Presently, the choices are quite narrow. The distribution of man-years of educational R&D effort, by setting, in 1968 is shown in Table 2, which is adapted from data in Appendix G.

Table 2—Distribution of Educational Research and Development Man-Years, by Setting (1968)

Setting:	*Man-years*
Universities and colleges	2,100
Total	2,100
State agencies	230
Local school agencies	800
Professional associations	280
Total	1,310
Private research institutions	260
Private firms	120
Educational laboratories	750
Total	1,130
Grand total	4,540

Since most R&D in universities and colleges is a part-time occupation, the 2,100 man-years in the chart represent the effort of a far greater number of individuals. In the other settings, however, R&D is more likely to be full-time. Thus, the great majority of educational R&D personnel are in higher educational institutions.

There are no more than 200 colleges and universities at which educational R&D is conducted. Of the 18,000 or so state and local education agencies and professional associations, clearly only a very small proportion can be devoting any effort to research, development, or innovation. Similarly, only several tens of private firms, at most, are responsible for the 120 man-years of effort expended in such settings. Finally, there are 15 Regional Educational Laboratories. This catalog describes the present institutional setting for educational R&D.

How should it be strengthened? Several actions seem highly desirable.

First, the *higher education settings* could be strengthened by involving a wider range of disciplines than is currently active, by building critically sized centers for interdisciplinary R&D in education, and by linking R&D more closely with the education of educational personnel and with educational practice. (This effort, of course, has been begun—with some success—with the creation of Research and Development Centers.)

Second, the *state and local educational agency settings* could be strengthened by establishing R&D as an essential activity in all operating agencies. That is not to say that basic research or even product development should be under way in those settings, but rather that individuals with a solid training in educational science and technology should be there and that they should work closely with teachers and administrators. The R&D personnel would help with immediate, operational problems; assist in planning and evaluating innovative programs; link the knowledge and tools of educational R&D with practice; and encourage

and monitor the conduct of appropriate R&D in other settings. The presence of such personnel, aware of the findings of R&D and the problems of practice, throughout the operating system of education would go very far toward overcoming the considerable gap between research and practice that currently exists. Their position would be comparable in many respects to that of the engineer and operations analyst in industry or the extension agent in agriculture.

Third, the *private profit and not-for-profit institutional setting* could be strengthened by increasing its size and scope of activity and by linking it more closely to the state and local agencies and to the higher educational institutions. These institutions provide the major setting in which large-scale, long-term developmental and expermental efforts can be conducted. They also provide a setting in which critically sized, mixed teams of researchers and developers can be brought together to serve the needs of many different local and state agencies. Thus, whereas a small school district could not expect to hire a permanent staff of economists, psychologists, and technologists to help it plan significant changes in its educational practice, it (or a consortium of similar districts) could hope to make use of a private institution established to build such expertise. (Again, a start has been made with the establishment of Regional Educational Laboratories, and interstate and local consortia. Much needs to be done to strengthen those efforts, however.)

Thus far, the deficiencies of the performance side of the educational R&D system have been described. However, as was noted in the Introduction, to overcome those deficiencies and achieve an effective program of educational R&D will require considerable competence on the sponsorship side, especially in the principal Federal agency sponsoring educational R&D.

Need for Strong Program Management.—The wise allocation of R&D funds is an exceptionally difficult task that demands talents comparable to those needed to carry out R&D itself. The Federal program officer must be able to understand and select among activities that by their nature are at the frontiers of knowledge. He must be able to judge their prospects for success and estimate how well they will serve education's needs should they succeed. If competent and creative R&D talents are to be attracted to and retained in education's service, the program officer must attain their respect for the consistency and validity of his judgments. For these reasons, the agencies that sponsor educational R&D must be staffed by individuals of the highest competence, well trained in research or development, and in continuing close contact with their fields of research or development. In contrast to many government programs in which funds are allocated according to formulas and guidelines, well-run R&D programs are completely discretionary, with each decision for the expenditure of $10,000 or $1 million demanding expert knowledge and judgment.

Those Federal research funding programs that are generally judged to be successful have met these requirements through the adoption of special personnel systems designed to attract (in competition with universities, hospitals, and industry) scientists and engineers able to guide the wise expenditure of government funds. Two such successful programs are those of the NSF and the NIH. In Table 3 their personnel systems are compared with that of the NCERD.

Although the NSF expends about 5 times as much as the NCERD, it has 36 times as many authorized supergrade positions. Although both the NSF and NIH have flexible personnel systems designed to enable them to compete with the universities and industry for scientific personnel and bring such personnel into government for noncareer appointments, the NCERD employs a personnel system designed to serve the needs of managing large, formula support programs. And although the NSF and NIH have the stature and visibility that derives from leadership by men at the Level II or Level IV rank in the Federal Executive Schedule, the NCERD must assert its responsibility in the Federal government on the authority of a GS–17 director. The conditions do not yet exist to enable the Federal government to attract the caliber of staff needed to run a truly effective educational R&D program.

Thus, the NIE must take as one of its major supporting objectives the strengthening of the educational R&D community, both on the performer side and on the sponsor side. *The NIE should devote a portion of its resources directly to development of the R&D performer community through fellowships, institutional development grants, and similar mechanisms.* Some tentative program activities of this kind are described in Program Area IV in the next chapter. Establishment of the NIE is itself an attempt to strengthen the R&D sponsorship community. Its personnel and administrative provisions are described in Chapter IV, *Organization.*

TABLE 3.—PERSONNEL SYSTEMS OF NCERD, NSF, AND NIH

Item	NCERD		NSF	NIH
Budget, fiscal year 1970:				
Intramural				$120,000,000
Extramural	$90,000,000		$438,000,000	1,400,000,000
Total	90,000,000		438,000,000	1,520,000,000
	Authorized	Acting		
Managerial staff, 1970:				
Director	GS-17 1		EL II 1	EL IV 1
Deputy Directors and equivalents	GS-16 1	GS-16 1	EL III 1	GS-18 equivalents 10 GS-17 equivalents 1 GS-15 equivalents 2
Assistant Directors and equivalents.	GS-16 1 GS-15 3	GS-15 4	EL V 5	GS-18 equivalents 16
Deputy Assistant Directors and equivalents.			GS-18 equivalents 11	GS-18 equivalents 13 GS-17 equivalents 8 GS-16 1
Division Directors			GS-17 equivalents 32	GS-18 equivalents 9 GS-17 equivalents 17 GS-16 equivalents 9 GS-15 2
Total	6	5	50	89
Number with doctorate	0	3	39	11
Professional staff, 1970 (including management):				
Executive level			7	1
GS-16 to 18	3	1		87
GS-16 to 18, equivalent			101	85
(GS-16 and above)	(3)	(1)	(108)	(173)
GS-10 to 15 or equivalent		78	397	3,829
Total	3	79	505	4,002
(Intramural programs)		(0)	(0)	(1,582)
Number with doctorate		22	158	2,068
Number of fellowship appointments			35	285
	Civil Service only		Civil Service plus	Public Health Officer, Civil Service plus
Personnel system:				
1. Freedom to set pay anywhere in supergrade range.	No		Yes	Yes.
2. Civil Service approval of qualifications for pay needed.	Yes		No	Yes.
3. Career appointment	Yes		No	Yes.
4. Included in Civil Servce retirement plan.	Yes		Optional	Yes.
5. Agency quota for supergrades			No	Yes.
6. Filled from Civil Service quota for supergrades.	Yes		No	No.

III. PROGRAM

The most important and difficult choices to be made in creating the NIE are those that determine its program. The needs of education are so great, the R&D community's capabilities are so limited in comparison, and the available funds are so constrained that the design of a program that achieves the full potential benefit from R&D for education will be a demanding task. It is a task that should occupy a major part of the attention of the NIE staff, leadership, and advisory groups, not only at the beginning but throughout the Institute's existence.

Program also occupies a central place in planning for the NIE. What the Institute will do determines in large measure how it will be organized and how it must relate to its constituencies. It has not been possible during this planning effort to undertake the extensive analytic and consultative process that design of a final program for the NIE would require. However, the character and content of a program have been discussed, individually and in groups, with a wide range of respected individuals from the education and R&D communities. From those discussions has come a preliminary program that, while it cannot claim the legitimacy and stature that the Institute's carefully designed program will achieve, should suffice to establish the basic nature of the NIE's activities and to guide its organizational design. This chapter describes and discusses this preliminary program.

MAJOR PROGRAM STRUCTURE

Almost all of the NIE's program will be carried out by external agencies—higher educational institutions, state and local agencies, R&D Centers, Regional Laboratories, and other non-Federal institutions. No more than 5 percent, at least at the start, is likely to be performed internally. The major concern in the development of this program, therefore, has been with the description of activities that will be sponsored, but not conducted, by the NIE. The Institute's internal research agency, which will be described in the next chapter, however, will undertake activities within this broad program structure for which its staff an organization are specially qualified. Some examples of its possible activities will also be provided in the next chapter.

The structure of the research program follows the structure of the NIE's supporting objectives defined in the preceding chapter. Corresponding to each of these four objectives is a *program area* of the Institute.

Program Area I: Solution of Major Educational Problems
Program Area II: Advancing Educational Practice
Program Area III: Strengthening Education's Foundations
Program Area IV: Strengthening the Research and Development System

These program areas are divided, in turn, into several *program elements*. The number and definition of the elements in an area may change over time as priorities and competencies change. A preliminary set of program elements for the four program areas is shown in Table 4.

The program elements comprise, in their turn, a cluster of *program activities*. These would ordinarily be individual projects or groups of closely related projects. An extensive listing of prospective program activities appears later in this chapter. It is intended to convey through specific examples the *kind* and *range* of activity the NIE should undertake. It is not an attempt to describe precisely what the NIE should do.

The four program areas differ in the priority and support assigned to each, in the criteria and methods for program design, and in the range of R&D activities involved.

PROGRAM AREA I: SOLUTION OF MAJOR EDUCATIONAL PROBLEMS

The first priority of the NIE will undoubtedly be to organize, support, and carry out *comprehensive national R&D programs attacking major educational problems*. In support of that priority, *this program area might receive on the order of one-half the resources available to the NIE early in its history*. A number of the problems that might come under attack in this way were listed in the preceding chapter as part of the discussion of Supporting Objective I. As noted there, the process of problem "illumination" is a crucial part of the development of a problem-focused R&D program. Illumination of the nature of education's most crucial problems will be a major function of the NIE; the intramural R&D activity will play a central role in this process. However, the difficult passage from surface symptom to underlying problem has not been made during the first steps in planning for the NIE. Consequently, any selection of problems for this program area is likely to be flawed. At best, the problem definitions may have to be narrowed or redrawn to bring them into consonance with the capacity of R&D to solve them. At worst, they may be shown by deeper study to be shadows whose substance lies elsewhere. Nevertheless, some major educational problems must be selected, as exemplars, for this preliminary program. From among the variety of problems discussed in the preceding chapter, three have been chosen. They are:

The poor education received by the disadvantaged,
The inadequate quality of the education received by many, and
The need to use education's limited resources more effectively.

For present purposes, this selection of problems will suffice. It has been translated into program elements in Table 4.

Table 4.—Tentative Program Structure for the National Institute of Education

Program Area I: Solution of Major Educational Problems—comprehensive R&D programs addressing priority concerns.

Program Element 1. Improving education of the disadvantaged.
Program Element 2. Improving the quality of education.
Program Element 3. Improving the effectiveness of resource use in education.

Program Area II: Advancing Educational Practice—cumulative R&D programs developing education as an art, science, profession.

Program Element 1. Improving the instructional process—method and content.
Program Element 2. Improving the educational system—organization and administration.
Program Element 3. Improving educational assessment—measurement and evaluation.
Program Element 4. Improving the education of educational personnel.

Program Area III: Strengthening the Foundations of Education—selective research programs building basic knowledge concerning education.

Program Element 1. Increase knowledge of the individual as a learner.
Program Element 2. Increase knowledge of group processes as they affect learning.
Program Element 3. Increase knowledge of societal influences on education.
Program Element 4. Increase ability to use technology and media effectively in education.
Program Element 5. Increase effectiveness of analytical and research methodologies.

Program Area IV: Strengthening the Research and Development System—funding to facilitate formation of the complex network of individuals and institutions needed to link research, development, and practice.

Program Element 1. Develop supply of competent R&D manpower.
Program Element 2. Develop supply of effective R&D institutions.
Program Element 3. Strengthen linkage between R&D and practice.
Program Element 4. Develop structures for information transfer.

To help solve these major educational problems the NIE will want to do two things: first, bring to bear in a coordinated way all that is already known or developed that might help in resolving the problem; and second, focus careful effort on learning and developing what is needed to provide better solutions.

The R&D activity in this program area should be conceived, implemented, and managed through *comprehensive national programs.* These would be carefully designed, coherent combinations of research, development, experimentation, evaluation, and implementation activities directed at solution of major problems. Thus, each comprehensive national program would comprise not only activities intended to employ existing knowledge in the solution of a major problem, but also a wide range of activities—similar to those undertaken as part of the continuing programs in Program Areas II and III—intended ot develop the improved practices or basic knowledge essential if better solutions to that major problem are to be obtained. While each of these programs would be managed centrally to provide coordination and effective planning toward the objective, its component activities would be carried out in many settings.

Central management of each program element would be provided by an NIE *program task force,* led by a *program manager* and advised by an *advisory panel* of educators, R&D personnel, and laymen. The staff of the task force would comprise not only permanent problem-oriented R&D management personnel, but also personnel seconded from those parts of the NIE concerned with support of work on educational practice and foundations. They would bring to the problems task forces an awareness of the state of the art in their areas of concern, and would take back to those areas an enhanced appreciation of the needs of the educational system.

PROGRAM AREA II: ADVANCING EDUCATIONAL PRACTICE

The problem-focused activities undertaken in the first program area depend for their success on the educational tools and practices and the fundamental knowledge available. As noted, these activities will include efforts directed toward improving one or another tool, or toward extending knowledge in a particularly important way. But such activities will be undertaken with the specific needs of the problem area in mind. Even the union of all such activities undertaken as part of the problem-focused programs would not comprise a coherent, cumulative national program intended to improve the state of educational practice. The responsibility for the development and support of such programs falls in this area. *The area might receive as much as one-fourth of the NIE's resources early in its history.*

Among the constituents of educational practice that might be the subject of program elements here are the following:

The instructional process—the content of instruction and the methods by which it is conveyed to various student groups,

The educational system—the institutional and unstructured forms through which instruction is made available and how they are administered,

Educational assessment—the method and instruments by which educational progress is measured and evaluated, and

Professional development—the forms and content of preparation and continued training of educational professionals.

Once again, it is important to note that the NIE staff and advisory panels may find another categorization of the constituents of educational practice more fruitful. That is not so important here; these constituents will suffice to indicate the nature of the NIE's prospective program.

As a complement to the individual, targeted activities of these kinds undertaken as part of the problem-focused programs, the function of this problem area is the development and support of *continuing, cumulative national programs* that include a range of research, development, experimentation, and implementation activities intended to increase competence in each of the constituents of educational practice. These programs will attempt to do those things that offer the best hope of moving the state of the art forward. The activities would be carried out in many settings, would be less tightly linked together than the components of a problem-focused program element, and would provide both near- and farther-term returns.

Management of the program could be provided by a National Center for each program element, situated within the NIE. For example, the following Centers might be established to correspond to the proposed program elements:

Center for Instructional Process
Center for Educational System
Center for Educational Assessment
Center for Professional Development

Each Center would have a *Director* and an *advisory panel* charged with developing a viable national program in its area. The staff, all managers of extramural programs, would include both permanent professional members and others serving temporary tours, from the R&D and education communities. To assure coordination between these activities and the similar activities sponsored as part of problem-focused programs, staff members from the Centers would be seconded to serve, part-time, on problem-focused task forces.

PROGRAM AREA III: STRENGTHENING EDUCATION'S FOUNDATIONS

As noted in the description of Supporting Objective III in the chapter on objectives, educational practice and our ability to solve educational problems are founded on our appreciation and understanding of

The individual as a learner,
Group processes and how they affect learning,
Society and its relation to learning,
Technology and media useful in instruction, and
Methodology for investigating education.

To be able to put a fine edge on educational tools and to improve our solution of educational problems, then, it is necessary to provide a better understanding of the foundations of education. The responsibility for developing that understanding falls in this program area; *it might receive 10 to 15 percent of the NIE's resources early in its history.*

The program elements might correspond to the subjects of concern indicated above. Table 4 includes such a set of elements. They are defined in greater detail later in this chapter. Once again, it must be noted that another definition of program elements may prove more fruitful to the NIE's operations. This one is simply indicative.

The management techniques adopted in this program area should draw heavily upon the successful experience of the Office of Naval Research, NSF, and NIH. Although their procedures differ in detail, they are based upon a common appreciation of the most effective modes of encouraging and supporting research at the frontiers of knowledge. Each program element should, for example, be seen as *a portfolio of investments in new knowledge*, and like speculative stock portfolios, it is the total yield and not necessarily the performance

of each venture that is important. At the same time, a prudent investor will draw upon the most knowledgeable sources in choosing his investments. Those who know the frontiers of science best are those who are exploring them. Thus, the specification and selection of program activities in this area must depend, even more than in the areas, on the judgment of active scientists and scholars. However, to avoid too narrow a basis of choice, it will be desirable for the NIE to include a span of disciplines and a span of seniority in whatever review panels it employs to help in program-activity choices.

These activities will, of course, be heavily weighted toward the research end of the R&D spectrum, although the initial development of new technology and media is included in this program area as well. As a consequence, they are most likely to be carried out in traditional university and college settings, although the R&D Centers and Regional Laboratories might also undertake some work as part of larger programs.

The NIE management staff will comprise scientifically qualified *program officers*, who will rely heavily on *review panels* drawn from the research community. The staff will include both permanent officers and a number serving short terms on leave from their academic or research institutions. Like their fellows in Program Area II, they will be seconded to problem-focused task forces to help coordinate their work with support of similar activities as part of the problem-focused program elements.

PROGRAM AREA IV: STRENGTHENING THE RESEARCH AND DEVELOPMENT SYSTEM

The funds and interests made available through the NIE should, in the long run, bring into educational R&D the large enough pool of professionals and network of institutions whose lack was described in the preceding chapter. However, the NIE will not be able to wait for all the natural processes of attraction and decision to be acted out. If it is to make a big difference in the quality and effectiveness of educational R&D, it will have to catalize the process of growth and organizational of the R&D community as suggested by Supporting Objective IV. This is not an unusual function for a national R&D sponsoring organization. The NIH and NASA, among others, have been conscious of the need to help build the R&D communities required to fulfill their functions. This program area is devoted to that activity; *it might receive on the order of 10 to 15 percent of the resources available to the NIE early in its development.*

Among the constituents of the R&D community to which the NIE might want to devote special attention are

R&D manpower,
R&D institutions,
Linkages between R&D and practice, and
Information transfer within the R&D system.

The tools available to serve these purposes include fellowships and traineeships, institutional grants, support for information systems, and support for training.

The management of this area will be in the hands of *program officers*. They need two close linkages, however. One is with a continuous process of analysis and evaluation of the educational R&D community, carried out by the NIE, perhaps in close conjunction with the National Advisory Committee on Educational R&D. The purpose of this analysis and evaluation would be to identify and project into the future national needs for educational R&D personnel and institutions. While such projections are necessarily imperfect, they provide essential guidance for programs intended to produce such personnel and institutions. The other close linkage must be with the R&D programs sponsored by the NIE itself. One of the fundamentals of effective education for R&D is the close and continuous participation by the student in actual R&D projects. Since the NIE will be supporting most such projects in education, it is essential that training projects supported in Program Area IV be tied closely to R&D projects supported in other areas. Similar comments apply to institutional support, which should be related to program support; and to development of information systems, which should be under the aegis of institutions and individuals having R&D competence.

PROGRAM DESIGN

The preceding section has described the broad region of interest of the NIE. A mature national program of educational R&D would support activities in

every element of those four program areas, and in others not mentioned there, as well. However, at this stage in the development of the national educational R&D enterprise, it is unlikely that the resources—financial, personnel, or institutional—will be available to mount so comprehensive a program. *If the NIE is to succeed, therefore, it will have to focus its energies on particularly promising or important R& D activities.* It will have to place some bets.

On what basis should those bets be placed? Two criteria seem central: the *worth* of each individual area of activity, and *balance* in the total program.

The worth of each individual area is a compound of several factors. It depends, first of all, on the *importance* of the corresponding problem or area of concern. In such deliberations, work on reading problems would doubtless rank higher than work on teaching handwriting; fundamental studies of language acquisition would outrank equally fundamental concern with color perception.

But importance is not enough. There must also be a reasonable *probability of success*. This, in turn, depends on the difficulty of the problem or area of study and the availability of adequate intellectual tools, personnel, institutions, and funds to work on it. In several otherwise important areas of educational concern, shortages of personnel or institutions may prevent effective R&D activity.

Finally, there must be a reasonable *probability of implementation*. This is both a substantive and an institutional consideration. Substantively, it means that the likely problem solution or finding cannot be so expensive, difficult to execute, or unacceptable in other ways that it has little chance of being put into practice. Institutionally, it means that the eventual users of the solution or finding have to be involved with and interested in the R&D activity in such a way that the chance of their adopting it is high, and the problems of implementation have to be a part of the planning of the program from its inception.

Many program activities are likely to prove worthy—more than can be carried out or supported early in the NIE's program. The next step in program design, then, will be to select from among worthy program activities a set that constitutes a balanced program. A number of different balances must be struck.

One is between activities with a near-term return and those whose benefits come in the far term. It will, no doubt, be desirable that the NIE accomplish results as quickly as possible. To do so it will wish to undertake the support of some activities that have been under way a number of years and are coming to fruition. Several such activities should have high priority in program construction. But the NIE will wish to continue to contribute to educational improvement in the future. Educational R&D programs necessarily take a number of years to bear fruit. Thus, at the same time as the NIE is reaping this year's harvest, it will have to plant the seeds of future harvests. A high priority, thus, must also go to several activities showing high promise for longer-term return.

A second balance, related closely to the first, is among large-scale developmental and experimental programs and smaller-scale research and evaluation activities.

A third balance is among the various skills that should be applied in educational research. A properly designed program should include activities involving a broad range of professionals: researchers and developers, persons concerned with content and those concerned with method, social scientists and technologists, creators and analysts.

Finally, some balance must be struck among the various kinds of R&D institution. Most likely, this balance will be determined by the limited availability of certain kinds of setting and their specific competencies.

Thus, program design will result from some complex interaction between the worth of individual projects and the necessity of striking certain balances in overall program design. This interaction must be perceived and applied by some individual or group. The procedures the NIE adopts will be a crucial determinant of its success.

TENTATIVE PROGRAM ACTIVITIES

What would be the specific activities of a full-fledged NIE? Precisely what kinds of project would it undertake? How would they be distributed among research, development, evaluation, and implementation? How would they be distributed across the levels of education? What mixture of R&D skills would they employ? Where would they be conducted? These questions are hard to answer without referring to a rather detailed program for the NIE. Yet, for the reasons noted earlier, that program must derive from a process of extensive analysis, consultation, and review that has not yet been undertaken. It is a task demanding the staff, advisory groups, and consultants of the NIE itself. More important,

it is a task demanding judgments concerning needs and priorities that can only be made through the NIE's mechanisms.

Nevertheless, for several reasons, preliminary planning for the NIE requires more specific information about the NIE's program than is contained in Table 4. First, such information provides those unfamiliar with educational R&D with a map showing the breadth of its territory and enough detail to indicate the varied nature of its terrain. Second, the display of a wide range of specific activities having an understandable relationship to educational improvement and reform is the most valid evidence for the assertion that educational R&D needs additional support. Third, the NIE's organizational design, described in the next chapter, must be guided by an understanding of the kinds of activity likely to be a part of the NIE program. And fourth, a specific listing of activities can serve as the focus for discussion and criticism that will begin the several-phase development of an initial program for the NIE. Thus, this section contains a description of some possible program activities for each of the program elements shown in Table 4. This listing is still *tentative and preliminary*. Many additional steps must be taken before this listing of prospective activities can become an effective program for the NIE.

Among the steps—involving staff, advisory groups, and consultants—needed to transform this tentative program into an initial program for the NIE are the following:

Relative activities to those already under way. Many of the activities in the present listing are already being carried out. The next steps in program development should identify those explicitly, determine the progress being made, and suggest extensions or redirections.

Add desirable activities not already included. Despite the fact that far more appears in the program than educational R&D could hope to accomplish with existing resources, many valuable activities have been left out. No attempt has been made to be exhaustive in the activity listing. Rather, the objective has been to include a sufficient variety to suggest the scope of activities that could appear within a program element. Before undertaking the necessary priority-setting and selection, the next steps in program development should undertake to expand the listing of desirable activities. *It will be especially important to be hospitable to new program directions if the NIE is to achieve its goal of strengthening educational R&D.*

Identify relationships among activities. Educational R&D is a many-dimensional enterprise, with each activity relating to others in several different ways. No matter how the activities may be grouped and arranged in a map of educational R&D. as they are into program elements and areas in the tentative program, overlaps and close relationships will appear among activities listed separately. Thus, for example, the development of certain kinds of experimental schools is listed at several places in the tentative program. This simply reflects the fact that such a school may serve several R&D objectives; it is not meant to suggest that separate, but identically defined. experimental schools should be run as part of each program element. However, program development must identify and assign clear responsibility for these multipurpose activities. *To emphasize the interrelationships among educational R&D activities, the tentative program listing cross-references related activities through "related to" entries in many activity descriptions.*

Develop cost, manpower, and time estimates for activities. A valid program cannot be developed without sufficient information to face the real constraints of funds, time, and manpower.

Identify specific objectives for program elements. Especially in the case of Program Area I, general statements of objectives—such as, to improve the education of the disadvantaged—are insufficient to guide program design. The definition of specific objectives is prerequisite to the development of a coherent program.

Develop alternative plans for each program element. From the listing of possible activities, with associated cost, manpower, and time requirements, a series of alternative R&D plans (for different total cost figures) could be composed to achieve the specific objectives. This procedure would be most specific in Program Area I, less specific in Program Areas II and IV, and least specific in Program Area III.

Make program choices. On the basis of this detailed information, the program design choices described earlier can be made.

Thus, the tentative program listing that follows should be viewed only as a beginning. Development of an improved *Agenda for Educational Research and Development*, involving a wide range of consultation and extensive data gathering, should be the next step in preparation for the NIE.

PROGRAM ELEMENT I–1: IMPROVING EDUCATION OF THE DISADVANTAGED

Nature of the Problem

Disadvantage Before School.—Blacks, Puerto Ricans, Chicanos, American Indians, and whites growing up in poverty generally enter school behind their middle-class fellow students in measured achievement and readiness. They usually leave even farther behind.

Disadvantage in School.—In school, children from disadvantaged backgrounds have a variety of difficulties in coping with the standard school curricula and attitudes. The difficulties often lead to failure on standardized tests, poor self-images, lack of interest in school, boredom, inattention, disruption, violence, and withdrawal from education.

Disadvantage After School.—Too many from disadvantaged backgrounds leave school without competence in the basic cognitive skills, without marketable career skills, without confidence in themselves and their capacity to learn, and without a proper understanding of the society in which they will live. The result is a lifetime trapped in disadvantage and a new generaton of children born to it.

Possible Causes

Among the possible factors contributing to educational disadvantage are:

Early home conditions that hamper psychological development.

Insufficient verbal and intellectual stimulation in early years.

Home and neighborhood cultures different from those of the majority (and the schools).

Language difficulties arising from use of a different language or non-standard dialect outside of school.

Inappropriate curricula from the standpoint of relationship to child's experience, ability to develop his interest, reliance on books rather than experience, and so on.

Effect of narrow measures of capability and development on student morale and teacher expectations.

Inadquate motivation provided by family, peer-group, school, or society to lead student to believe that school success is desirable.

Insufficient information available to teachers on special needs of disadvantaged and on programs that have been more successful than most.

The unmet need for more intensive instructional programs than are generally provided.

Program Activities

A coherent R&D program attempting to alleviate the educational deficiencies of the disadvantaged must address many of these possible causes and comprise activities ranging from research, through development, experimentation, and assessment, to implementation. Among the program's constituents might be:

1. *Basic studies*, by behavioral and social scientists (including educationists) of the causes and nature of educational disadvantage and of special characteristics of the learning process among disadvantaged children:

What motivates disdavantaged students to learn—and what discourages them?

What is the nature and extent of extraschool learning from television, friends, family?

What are the effects of nutritional deficiencies on learning?

How do dialect or first-language differences affect learning?

What is the extent and degree of disadvantage? How is it distributed?

(Related to III–1, III–2, III–3.)[1]

2. Pilot *curriculum development and research programs* producing materials directed at the needs of the disadvantaged, such as:

New or modified curricula in the arts, sciences, and humanities responsive to the needs and interests of the disadvantaged. For example, history

[1] Where related activities are suggested under several program elements, they will be cross-referenced through "Related to" entries of this form. The entry III–1 refers to all of program element 1 in program area III. The entry III–1.2 refers to the activity number 2 in that element.

courses that more adequately cover the roles of Blacks, Chicanos, and Indians in the development of America; literature courses that employ materials of contemporary interest to draw the students into the continuity of literary development; science courses that help the student to understand the urban environment. (This activity should be undertaken in cooperation with the NSF and the National Foundation on the Arts and Humanities.)

Materials and procedures for increasing the sensitivity of students and teachers to the problems and needs of others—for example, films presenting specific human-relations problems to be discussed in class; reading and writing activities designed to foster understanding of others.

Further development of television programs—on the model of *Sesame Street*—that teach *and* interest youngsters.

Curricula, perhaps employing technology extensively to facilitate self-study, to help postsecondary students from disadvantaged backgrounds overcome prior deficiencies in reading, mathematics, and so on.

(Related to I-2.2, II-1.4.)

3. A comprehensive program on *early childhood education* (in cooperation with the Office of Child Development, NSF, and NIH), seeking improved ways of giving each child a proper start before elementary school:

Basic studies of cognitive, emotional, and social development from birth.

Development of improved materials for teaching parents and prospective parents about the ways children develop intellectually and socially and how to help them. (These might include courses for use in high school, television programs, books, neighborhood center programs, adult education, and toy libraries.)

Development (and evaluation) of curricula and programs for daycare centers.

(Related to III-1, III-2, III-3.)

4. A program of *experimental schools* established to try out in practice a variety of alternative forms of education for the disadvantaged. The schools would have normal (and comparable) school populations, be provided with additional funds and staff for planning and development activities, and pay careful attention to comparative evaluation. School personnel would work closely with community people and R&D staff universities and educational laboratories. Some experiments might be:

A school on the model of the informal British primary schools in which a rich environment, physical objects, and interesting activities provide strong motivation for learning.

A school making extensive use of television and computer media to provide flexible, individualized instruction.

A school with heavy community involvement in control, teaching, curriculum, personnel, and disciplinary matters.

(Related to I-2.1, II-2.1, II-2.3.)

5. Development of *new measures of educational achievement*, including:

Measures of student capability that do not penalize the student because of cultural differences.

Measures of noncognitive qualities—self-confidence, responsibility, leadership.

(Related to II-3, III-1, III-2.)

6. *Transmittal of the results of R&D to teachers and school administrators* through mechanisms such as:

Development of curricula on education of the disadvantaged for teacher-education institutions and in-service programs.

Cooperation with the NSF and with OE's Bureau of Educational Personnel Development in encouraging participation by teachers in curriculum development projects along the lines of the very successful British Schools Council.

Development of brochures, books, films, magazines, and other materials on effective education of the disadvantaged.

(Related to I-3.5, II-4, III-2.7, IV-3, IV-4.)

Programs 1 through 6 represent, but do not delimit, the kinds of activity that an effective program would have to undertake. The precise choice of activities and the design of the linkages among them must await a careful program design activity. Note, however, that these programs span the range from basic research, through development, experimentation, and assessment, to innovation.

PROGRAM ELEMENT I-2: IMPROVING THE QUALITY OF EDUCATION

Nature of the Problem

Failure to Excite Students' Interest.—Students from the whole range of abilities, social backgrounds, and educational levels are finding much of standard educational fare irrelevant to their needs, their interests, and their perceptions of the world.

Failure to Provide a Wide Enough Diversity of Educational Choices.—Despite the wide variety of individual needs, interests, and learning styles and the differing aspirations of parents and communities, school and college programs are remarkably alike throughout the country. Parents and students usually have no choice among schools and little possibility of choice within the assigned school. In a society that celebrates the diversity in its marketplace, there is virtually no choice in the schoolroom.

Failure to Serve the Career Needs of Many Students.—Too many students leave the formal educational system unequipped or ill-equipped for work. Their courses have failed to prepare them to handle the real problems they will encounter on the job; have steeped them in present or outmoded knowledge without preparing them to adapt to the inevitable changes; and have not given them sufficient information on which to base career choice. Moreover, despite the growing need for continuing education during careers, for reeducation to new careers as society's needs change, and for postponed career education by those who choose motherhood or other experiences first, the education system makes only inadequate and haphazard provision for continuing career education.

Failure to Develop Effective Methods of Instruction.—Despite the experience of other national enterprises in which new technologies and new procedures have combined through the years to raise effective productivity, education's "technology" remains almost unchanged from what it was at the beginning of the century. Although experimentation with new methods, materials, and media has been carried out, it has had little lasting effect on the classroom.

Program Activities

Among the constituents of a coherent R&D program might be:

1. A program of *experimental schools* in which are tried new methods of education, intended to stimulate and exploit the interests of the students. Among them might be:

A school with opportunities for students to work "off campus" in a job or project related to their interests.

A school combining self-paced study with classroom study with inside-the-school jobs in a mixture that changes as students' needs and maturity change.

A school that breaks down the barriers between school and community by taking students out into the community and by bringing community people into the schools.

A school that employs technology freely and creatively to provide the teacher with new tools and to free students from the academic lockstep.

A school that employs student interests in socially desirable enterprises as a means of organizing learning activities.

(Related to I-1.4, II-2.1, II-2.3.)

2. An extensive program of *curriculum development*, in cooperation with the NSF and the National Foundation on the Arts and Humanities, to insure that for each subject in the elementary and secondary curricula there are several sets of materials available that:

Have involved persons at the forefront of knowledge or art in their development (so that the excitement of contemporary application and the approach to emerging problems will be included) as well as classroom teachers (so that children will indeed experience that excitement).

Have provided for individualization with regard to students' interests and learning style.

Have made full use of new technology and media to extend possibilities, improve learning, and assist teaching.

(Related to I-1.2, II-1.4.)

3. Support for *experimentation with new forms of education* intended to serve better the needs for various forms of career education, including:

Programs that phase the transition from school to work over the late-teen years, gradually decreasing school attendance.

Programs held at work sites in conjunction with employers and unions.

Programs (especially in higher education) relying on extra-school instruction employing the new instructional technologies and independent certification via formal examinations by accredited agencies. (This concept is now referred to as the "External Degree.")

Programs viewed by student and school or college as extending over the student's full career, enabling him to reenter his institution whenever he has the need and the opportunity.

(Related to II-2.1, II-2.5, III-3.4, III-3.6, III-4.2, III-4.3.)

4. Exploration through research and experimentation of better ways of *linking individual and community needs, educational objectives,* and *school services.* This might include rather basic studies of the possible objectives of education and its current success in achieving them, as well as support for community efforts to define local educational objectives. It might also include experiments with various linkages between community and schools to determine the advantages and disadvantages of each. In support of such experiments would be studies of various forms of educational governance, of measurement of educational performance, and of experience in other countries.
(Related to I-3.4, I-3.5, II-2, II-3, III-2, III-3.)

PROGRAM ELEMENT I-3: IMPROVING THE EFFECTIVENESS OF RESOURCE USE IN EDUCATION

Nature of the Problem

Reduction in the Rate at Which New Resources Are Made Available.—Voters in many states and communities have rejected bond issues and budget increases; many school districts have been forced to eliminate programs or to shorten school sessions. Both public and private higher education institutions are finding their sources of funds shrinking.

Increases in the Costs the Education System Must Pay.—Teacher salaries, which are by far the largest part of educational costs, are rising without comparable increases in teacher productivity. Other expenses are subject to the general inflationary trend. When introduced, new materials and technology ordinarily increase, rather than reduce, the cost of education.

Increasing Demands for Service.—While resources remain relatively fixed, demands for the schools to provide new services to additional clientele at higher quality add to the job that must be done and increase costs.

Inadequate Knowledge and Methods to Achieve Most Effective Resource Use.—Data concerning the relationship between educational inputs and educational output are virtually nonexistent. School officials cannot easily estimate effects of changes in input expenditure on output. Many decisions are dictated by "traditional" rules of thumb unsupported by evidence.

Program Activities

1. A research program to develop better *information about current educational resource use and constraints,* including studies of staffing patterns, personnel policies, and contract provisions; use of technology and materials; utilization of facilities.

(Related to II-1.1, II-1.5, II-1.6, II-2, II-3, II-4.1, III-2.4, III-2.7, III-3, III-4.)

2. A program of studies of *educational finance* intended to provide a firmer basis for public decisions. Among the activities might be:

A study of alternative forms of Federal support to higher education.

Investigation of the interrelations among Federal, state, and local support of elementary and secondary education.

A study of the influence of various categorical aid programs on the flexibility and efficiency with which schools expend their resources.

(Related to III-3.1, III-3.2, III-3.3.)

3. Experiments with new forms of *resource utilization*, such as:

New staffing arrangements for carrying out the range of educational tasks, including use of students as tutors and teachers, differentiated staffing, and employment of paraprofessionals.

Greater use of technology to allow the teacher to command the same range of technical aids as persons in other professions and thus to achieve higher quality and productivity.

Greater use of less-expensive classroom equipment so that more can be bought with limited budgets; greater use of inexpensive materials in the classroom; and more use of the natural or man-made environment outside the classroom as a teaching laboratory.

Provision of buildings through rental or joint-use construction. Encouragement of year-round, night and weekend building use for educational activities serving the adult and part-time student communities. Use of remodeled older buildings and storefronts for schools.

(Related to II-1, II-2, II-4, III-4.)

4. Development of new *aids to effective school decision-making* in cooperation with a number of school districts. This program might include a number of activities aimed at improving the data and methods employed in making school decisions. Among these might be:

Design and experimental implementation of a computer-based school information system to provide decision-relevant data on school costs, student performance, and teacher roles.

Development of accounting and budgeting systems for schools and school districts that will associate input costs with specific school programs.

Adaptation of analytical techniques from operations research and systems analysis to school decision problems.

Research on the relationships between school inputs and school outputs for various school populations so that guides to effective resource use can be developed.

Development and test of evaluative techniques through which school managers can analyze their systems' performance and locate potential problem areas.

(Related to I-2.4, II-1.1, II-1.6, II-2, II-3, III-3, III-5, IV-1.2, IV-2.2, IV-3.)

5. Experimentation, research, and development on *incentives for effective resource allocation*. Since it is often asserted that school systems lack strong incentives to be effective in resource use, this program would include several studies addressed both to better understanding of existing incentives and to design of improved incentives:

Research on existing incentives affecting resource use that are offered to teachers, students, and school systems. The effect of the provisions of various state and Federal funding programs would be of special interest.

Development and testing of new forms of school governance affecting resource-use incentives; examples include school-to-community accountability, performance contracting, and competitive schools.

Experimentation with greatly increased teacher responsibility for classroom decisions (including allocation of budget, choice of equipment, aids, etc.) and for consequent performance.

(Related to I-1.6, I-2.4, II-2, II-3.1, III-2.4, III-2.7, III-3.2, III-3.3.)

PROGRAM ELEMENT II-1: IMPROVING THE INSTRUCTIONAL PROCESS—CONTENT AND METHOD

Area of Concern

The instructional process is the center of education. Its effective accomplishment is the reason for everything else. It is the point where learner and instructor, subject matter, method, media, and materials come together. The art and science of that combination should be the primal subject of educational R&D.

The process attains seemingly infinite complexity. The possible number of distinct combinations of student characteristics, teacher characteristics, subjects of study, teaching methods, media, and materials is astronomical. Yet for each different combination of student, teacher, and subject there may be a different combination of method, media, and materials that is most effective. As a result, most studies proceed by holding almost all factors constant and varying only one or two. Not surprisingly, most studies fail to show significant difference or to attain significant generality.

Nevertheless, careful cumulative efforts to increase understanding of the instructional process are essential to the quest for fundamental progress in education. Understanding of the incremental influences of each controllable factor must be sought. What are the effects of different teaching styles? How can new media be used effectively? What curriculum improvements can be made for a specific subject matter? Some factors or combinations of factors will have greater effect than others. They should become the foci of major efforts.

Program Activities

Among the programs that might be included in this program area are:

1. Research to determine how the various *school inputs affect school outputs*. Studies of this kind have been given impetus by Coleman's study, *Equality of Educational Opportunity*. Using various sources of data, studies have attempted to determine through statistical techniques which factors (student background, teacher characteristics, school facilities and supplies, etc.) affected student achievement on standardized achievement tests. While a fair amount has been learned, weaknesses in available data and evaluation instruments, and the narrow range of schooling situations have inhibited progress. A careful program of this kind might be linked with the experimental schools so that longitudinal data from a wide range of schooling situations could be attained. From such studies would come better information about which factors in the instructional process offer the greatest leverage for improvement.

(Related to I–3.1, I–3.3, I–3.4, II–3, III–5.)

2. Research on *teacher styles and strategies*. A fair amount of effort is going into studies of the minute-by-minute tactics of teaching. Studies should also be undertaken of the larger strategic decisions by which a teacher's entire approach to a class and subject are shaped. What distinguishes the teaching styles of those teachers who have achieved success with disadvantaged children? How can teaching styles be described and evaluated?

(Related to I–1.6, II–4.)

3. Research into *curriculum development practices*. Considerable experience with the development of new curricula has been obtained during the past dozen years, especially in the sciences and mathematics, as a result of NSF sponsorship. Future efforts at curriculum development and, especially, the training of development personnel would be aided by a careful attempt to study and distill this experience.

(Related to IV–1.3, IV–2.2.)

4. *Development of curricula*. Although curriculum development is proposed as a central activity in the program areas concerned with the disadvantaged and the quality of education, it also should form a part of this program area. Here, however, the emphasis would be on curriculum developments that extend the instructional process by, for example, relying heavily on new technology (cassette or cable television, computers, audiovisual cassettes, etc.) or using different teaching methods, innovative school settings, or unique subject matters.

(Related to I–1.2, I–2.2.)

5. *Development of technology and media*. This program would support efforts intended to develop effective instructional tools employing contemporary technology. For example, it would experiment with modes of use of cassette television in and out of school; with computers as aids in higher and continuing education; and with broadcast television in conjunction with these other technologies. It would pay special attention to adapting new communication technologies to provide access to education to those outside the formal educational system.
(Related to I–3.1, II–2.1, II–3.3, II–4.6, III–4.)

6. An *experimental program* examining a wide range of alternative mixes of students, teachers, subjects, methods, media, and materials to develop better understanding of their interrelationships.
(Related to I–3.1, II–2.1, II–3.4, III–1, III–2, III–4, III–5.)

PROGRAM ELEMENT II–2: IMPROVING THE EDUCATIONAL SYSTEM—ORGANIZATION AND ADMINISTRATION

Area of Concern

The educational system provides the matrix in which the instructional process occurs. That matrix determines to a large extent the amount and pace of instruc-

tion, the structure of classes, the incentives seen by students and teachers, the allocation of resources, and interaction with the community.

One major system question is, *What forms should education take?* The traditional form in which fixed-size classes move grade-by-grade through a specified series of courses and examinations under the tutelage of a sequence of individual instructors at a special place (called a "school" or a "campus") is being challenged by changing circumstances and clientele. Careful experimentation with and evaluation of alternative forms of education, including new types of educational institution, are required.

Whatever form is employed, the need to organize and administer it effectively will arise. Objectives must be set, personnel selected and evaluated, resources allocated, curricula chosen, progress determined, rules and sanctions developed. So a second system question is, *How can alternative forms best be organized and administered?*

The education system itself exists within a larger matrix—society. Its success depends, in the end, on how well it meets society's needs, including those of individual members. A third system question then is, *What should be the relations between the education system and the community?*

Program Activities

1. A series of *experiments with widely varying forms of education* including, for example:

Schools that combine instruction with employment.

Schools with higher-than-usual pupil/teacher ratios but much greater use of self-study methods and technologies.

Schools that partake actively of the community and operate from storefronts, old buildings, and the like.

Schools that mix age-groupings and use older students to help younger ones.

Schools without grade reports, but which require mastery of a topic before the next one can be begun.

Education outside of the regular schools, certificated by state or national examination programs.

(Related to I–1.4, I–2.1, I–2.3, I–2.4, I–3.1, I–3.3, I–3.5.)

2. Development of *improved management techniques*. Some of this work would, of course, be undertaken as part of the program area concerned with effective resource use. However, the interest here would be in the wider-range and longer-term activities not having so explicitly a resource-effectiveness payoff. Activities might include:

Development of improved cost-analysis and budgeting procedures.

Analysis of alternative personnel and salary policies and their consequences for teaching effectiveness.

Development of procedures for achieving reasonable "accountability."

(Related to I–3, II–3, III–3.)

3. *Experimentation with and evaluation of forms of governance.* The increased militancy of students and faculty and changing social mores have given rise to demands for changes in school and college governance. This program would study these changes, identify the range of possibilities, and review the experiences of these natural experiments as a guide to further changes. When appropriate, it would also support experiments with previously untested forms.

(Related to I–1.4, I–2.1, I–2.3, I–2.4, I–3.5, II–3.1, III–2, I–3.)

4. A program to *evaluate experiments in establishing closer school/community relations* through such devices as decentralization and local school boards, accountability, and the introduction of incentives and market features.
(Related to I–2.4, I–3.5, II–3.1, III–2, III–3.)

5. Experimentation with methods of widening the range of *extraschool education*. This program would seek to develop education systems to serve the needs of:

Women past child-rearing age who would like career training.

Midcareer workers who would like to enter a new career or upgrade their skills significantly.

The older disadvantaged who would like to overcome the deficiencies of prior schooling.

(Related to I–2.3, I–2.4, III–3, III–4.)

PROGRAM ELEMENT II-3: IMPROVING EDUCATIONAL ASSESSMENT—MEASUREMENT AND EVALUATION

Area of Concern

Assessment is the provision of information about the performance of the educational system to assist in educational decision-making—at all levels of education. If assessment procedures are narrow or imprecise, the information will be incomplete and the decision may be mistaken. Progress in the development of assessment procedures, then, affects the rate at which educational decisions can improve. At the same time, assessment depends on some indication of educational goals and objectives to guide what is to be assessed. If assessment procedures do not respond to a careful identification of the relevant goals and objectives, then decision may be misguided. Progress in the development of assessment procedures, then, affects the direction of educational improvement.

There are many kinds of assessing that must go on in education. Among them are measurement of student and teacher qualities; evaluation of the effect (on the average) of an educational program; measurement of individual student progress; evaluation of the effect (on the average) of an educational institution; and evaluation of the effect of a Federal or state program of educational support. Moreover, there are many criteria or objectives that might be considered in each measurement or evaluation, and there are several different kinds of decision (with different information needs) that each one might serve.

Thus, a national program of research and development in assessment must push a very broad frontier forward. A major portion of the NIE's intramural program should be devoted to this area of concern, since assessment is central to the illumination of major educational problems and to the wide-ranging examination of the state of education.

Program Activities

1. Development of *techniques and procedures for assisting in the identification of educational goals and objectives and reporting on progress toward their attainment.* The heightened concern for making education more responsive and responsible to its clientele—the students, the community, the society, has increased the ever present need to identify the goals and objectives that each part of the educational system should be serving. The drive for "accountability" in local schools, for example, raises the following questions: How can a community develop and express goals for its local schools? What are the advantages or disadvantages of ballots, questionnaires, or elected representatives as means of determining community goals? How can progress toward the attainment of goals best be reported? What instruments exist for which goals? Toward which goals must progress be evaluated judgmentally? How should results be adjusted to reflect differences in home and student characteristics? What other analysis and interpretation is desirable? What procedures for presentation of the results to the community are appropriate?

There are analogous questions for assessment of the performance of other constituents of the educational process: Federal programs, state programs, local programs, curricula, teachers, students. (Related to I-2.4, I-3.4, II-2.2, II-2.3, II-2.4, III-2, III-3.)

2. Development of *techniques and instruments for evaluating a far broader range of education results* than are commonly considered. Among the requirements are:

Methods for assessing psychological development, cognitive and motivational, that are independent of interpersonal comparison, age, and cultural background.

Methods for assessing learning outcomes referenced to objectives, that are independent of interpersonal comparison, age, and cultural background.

Methods for assessing social development, that are independent of interpersonal comparison, age, and cultural background.

Methods for assessing the development of learning skills and incentives. Techniques should also be developed for identifying and measuring some of the reasonably objective consequences of educational programs on society, and some of the educational effects of outside-the-school influences—family, friends, television.

(Related to I-1.5, I-2.4, I-3.4, II-1.1, II-1.6, II-2.2, III-1, III-2, III-5.3.)

3. Development of *new procedures for evaluation* that go beyond the application of traditional measuring instruments. Among the possibilities here are:

Computer-based examinations that adapt the sequence of questions presented on the basis of student responses and that permit realistic problems to be presented with reasonable economy.

Anthropological field-study techniques that identify the nature of changes in the social behavior of students and teachers, both in school and outside.

Longitudinal data-gathering on a variety of groups of students passing through various educational experiences that can help to identify long-term effects of education and, if repeated regularly, long-term changes in the educational process.

Resource-effectiveness evaluations that explicitly determine the resource inputs associated with effectiveness outputs so that alternative programs may be compared in terms both of resource use and effectiveness.

(Related to III–5.)

4. Development of *principles for evaluation of important classes of educational activity*. The state of evaluation methodology for many types of educational activity is primitive. Nevertheless, the demand and need for such evaluations is high. The NIE could help considerably by supporting the development of procedures for evaluating:

Federal education programs, especially multiagency programs having broad, national impacts.

Educational experiments, both planned and "natural," so that essential information may be obtained from experience with educational variations.

Extraschool educational influences, both positive and negative.

(Related to I–1.4, I–2.1, I–2.3, I–2.4, I–3.2, I–3.3, II–1.1, II–1.6, II–2, III–3, III–4, III–5.)

5. *Evaluation of ongoing evaluations* and the development of standards for good and relevant evaluation. This activity (and the preceding one) might sponsor exemplary evaluations or provide guidance on appropriate reporting standards. It should include studies of data security and privacy relating to measurement and evaluation. Who should have access to what data under what conditions?

(Related to IV–1, IV–2, IV–3.)

6. Development of programs for the *training of educational evaluators*. The NIE might both sponsor the development of educational programs for the training of evaluation personnel and provide support for the training of evaluation research personnel. (These activities would be carried out in cooperation with OE's Bureau of Educational Personnel Development.)

(Related to II–4, IV–1.)

PROGRAM ELEMENT II–4: IMPROVING THE EDUCATION OF EDUCATIONAL PERSONNEL

Area of Concern

In the final analysis, educational improvement—at all levels—depends on changes in the way faculty teach and administrators administer. Unless R&D results are used to modify classroom and school practices and affect instructor and administrator behavior they will be for naught. Thus, the teacher—education system (including the graduate schools, which educate college and university faculty) should be a principal *consumer* of educational R&D results. But teacher education itself demands improvement, in the same way that other school and college education does, so the teacher-education system must also be a principal *subject* of educational R&D.

The central questions are: What educational experiences do different kinds of educational personnel—at every level of education—need before and during their years in the school and classroom? How can teachers be equipped to identify individual student needs and be provided with a wide repertoire of responses to those needs? How can teachers and administrators be provided with the knowledge and competence constantly to review their approach to education as circumstances and requirements change? How can educational personnel be prepared to participate in and employ the findings of R&D? How can the capacity of colleges and universities which prepare the nation's teachers be strengthened to bring about these changes?

The work in this program element would be carried out in close cooperation with the OE Bureau of Educational Personnel Development and the NSF.

Program activities

1. Development of *techniques for the identification and selection of effective teachers.* Are there common intellectual and motivational characteristics of effective teachers? Can individuals who have the capacity to become effective teachers be identified before they enter teaching? Can procedures for the selection of such individuals be developed? What techniques—strategic and tactical—do effective teachers use? Can they be conveyed to other teachers? Can methods of evaluating teaching proficiency be developed? Similar questions may be asked about administrators, teacher aides, and so on. (Related to I–3.1, II–1.1, II–1.2.)

2. A continuing *review and evaluation of teacher preparation.* This activity would examine and project national needs for educational personnel; examine existing programs for meeting those needs; and identify needs for further R&D to improve the education of educational personnel. It would undertake a variety of evaluations of teacher (and administrator) education programs, here and abroad, with regard to their preparation of educational personnel for the tasks they will face in the schools.

3. *Development of markedly different materials for the preparation of educational personnel.* A wide range of materials development options should be explored, including:

The use of media and technology to record practical teaching situations and styles for examination and review during the preparatory program.

The creation of simulated classroom situations that enable teachers to develop teaching skills under realistic conditions.

The use of media and technology to provide instructional modules for independent use by teachers, before and during service, to learn specific knowledge and skills.

(Related to III–4.)

4. Experimentation with *new forms of teacher education* that:

Attempt to link training, research, and practice more closely through association between colleges and universities and local schools, which serve as sites for student teaching internships, R&D, and innovative practice.

Involve prospective teachers in the practice of teaching from their first year of higher education and onward.

Employ the same kinds of innovative methods in teaching teachers as teachers are taught to use.

Attempt to develop the attitudes and skills that will enable teachers continually to examine and improve their teaching practices throughout a 20- or 30-year career, including an awareness of the findings, concerns, and uses of educational R&D and an ability to participate in R&D activities.

(Related to I–1.6, IV–3.)

5. Investigation of improved ways to *tie the findings of educational R&D to teacher preparation and refreshing.* One critical link in the path from knowledge to practice is the one that transmits the knowledge to teachers in a form that they can use. This must occur during precareer training and, for most teachers, during practice. This program would experiment with various ways of doing this, attempt to evaluate their relative effectiveness, and use the result to help design improved systems of teacher training.

(Related to I–1.6, IV–4.)

6. Development of *educational programs for new educational careers,* including:

Paraprofessional teacher aids.

Teachers who specialize in preparation of curricula for use with the new technologies and who, like film and television artists, are sensitive to the demands and potential of those technologies.

Educational "extension agents" who convey the findings of educational R&D to practicing teachers.

Educational evaluation specialists who can design and implement evaluation schemes for new educational programs.

(Related to I–1.6, I–3.3, II–3.6, IV–1, IV–3, IV–4.)

PROGRAM ELEMENT III-1: INCREASING THE KNOWLEDGE OF THE INDIVIDUAL AS A LEARNER

Topics of Concern

An understanding of the individual learner is central to education. Advancing that understanding is a concern of several of the social and behavioral sciences. In these areas of basic science, the specification of research projects properly is left to the scientists who must carry them out. Rather than list su.a specific activities here, then, a number of areas in which activity should be supported are identified:

1. *The biology of learning.*[1]—Studies of the biophysics and biochemistry of brain function; genetic factors affecting intellectual activity.
2. *The development of the child.*—Studies of the stages of mental and physical development; external influences on development. The effects of pre-natal and peri-natal environmental influences on mental development.
3. *Language acquisition and use.*—Studies of the process of learning a language; relationships between language and other mental functions.
4. *Perception and memory.*—Studies of the process of gathering, structuring, and storing information from the environment; relationship to learning.
5. *Information processing.*—Studies of the ways humans manipulate information: reasoning, creativity, pattern recognition.
6. *Motivation.*—Studies of the factors that affect the individual's desire to learn and use his knowledge.
7. *Individual differences.*—Studies of the ways in which individual learners differ. the causes of those differences, and how the differences may be identified.
8. *Deficiencies, abnormalities, and pathologies.*—Studies of the various types of emotional and intellectual disturbances, their sources, and remediation or alleviation.

PROGRAM ELEMENT III-B: INCREASING KNOWLEDGE OF GROUP PROCESSES AS THEY AFFECT LEARNING

Topics of concern

The individual learner is not really that. He is, rather, a member of many groups, each of which exerts influences on his desire and ability to learn. The understanding of such influences is the concern of several of the basic sciences. Among the areas that the NIE should support are:

1. *Peer-group influences on learning.*—Studies of the role of peer attitudes and pressures on individual motivation and achievement; the role of formal mechanisms (competition, cooperation) and informal mechanisms ("everyone goes to college").
2. *Family influences on learning.*—Studies of the role of family attitudes and pressures on individual motivation and achievement; differences attributable to differences in family composition and character.
3. *School influences on learning.*—Studies of the role of teacher attitudes and pressures on individual motivation and learning; the role of relations among learning individuals.
4. *Socialization/acculturation.*—Studies of the processes by which individuals adopt and accept the shared assumptions of a group, culture, or society; factors that favor or hinder such processes.
5. *Formal educational organizations.*—Studies of group processes as they affect the functioning and management of schools; student, teacher, administrator relationships and how they change with student age; effects of school organizations on learning.
6. *Group norms and sanctions.*—Studies of the processes by which formal and informal groups develop and enforce norms; factors that lead individuals to adhere to or deviate from group norms.
7. *Racial, social class, and economic factors in group behavior.*—Studies of the ways in which individual differences affect group formation and maintenance; intragroup and intergroup conflict and individual differences; effects of prejudice.
8. *Group influences on innovation.*—Studies of the inhibitory or supportive effects of group pressures on the process of change; groups and their influence on educational innovation.

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[1] Since activities in Program Area III are relevant to most of the activities in Program Areas I and II, no specific cross references are given for them.

PROGRAM ELEMENT III-3: INCREASING KNOWLEDGE OF SOCIETAL INFLUENCES ON EDUCATION

Topics of Concern

Education is a central function of society. Through education society transmits to the new generation the knowledge, values, and skills brought forward from previous generations and developed by the present one.

Through education society meets its needs for trained manpower and a competent citizenry. There is then a close and complex relationship between society (broadly construed to include politics, economics, and culture) and education. Studies of that relationship are the concern of several of the social sciences. Among the areas that the NIE should support are:

1. *Economic benefits of education.*—Studies of the contribution of education to the economy through increases in human capital; education as a productive factor; individual and societal gains from education.

2. *Educational finance.*—Studies of the economic reasons to support education; alternative support mechanisms; costs and benefits of various mechanisms for various population groups.

3. *The governance of education.*—Studies of the forms of governance of education; the role of special-interest groups; state, local, and Federal government roles.

4. *Social change.*—Studies of the effect of rapid social change on the forms and content of education; the school as a mechanism of social change.

5. *Race and schooling.*—Studies of the influence of racial factors on access to and benefits from schooling.

6. *Nonschool education.*—Studies of the effects of nonschool educational influences, such as TV, film, newspapers, on the intellectual and social development of students.

7. *Education and societal needs.*—Studies of the processes by which education does or does not adjust to provide the skills and knowledge needed by society or its members; social incentives that affect education.

8. *Objectives of education.*—Studies of the appropriate objectives for education in contemporary American society.

9. *History of education.*—Studies of the development of educational ideas and of the experience of previous generations and societies with various forms of education.

PROGRAM ELEMENT III-4: INCREASING THE ABILITY TO USE TECHNOLOGY AND MEDIA EFFECTIVELY IN EDUCATION

Topics of Concern

Technology has revolutionized many of society's functions; not so, education. Despite the evident potential of the new communications and information technologies, the effective use of television, computers, and allied media is almost nil in American education. The reasons for this deficiency are unclear. Nevertheless, the potential benefits from the technologies are so high that careful efforts to develop them are warranted. In addition, further efforts to develop the conventional audio and visual media are justified, especially with the greater convenience now offered by audio casettes and 8-mm film loops. Other technologies of interest to education include those used to create the instructional environment—buildings and equipment. Studies and development of the media and technologies are the concern of basic scientists, technologists, and artists. Among the areas the NIE should support are:

1. *Instructional uses of the computer.*—Studies and development of improved uses of the computer in instruction; exploitation of time-shared and casette-programmed minicomputers; implications for nonformal education of computer-based instruction. Close cooperation with the NSF would be maintained.

2. *Casette television and cable television.*—Studies of the potential of new television technologies for education; roles in formal and nonformal systems; validation and certification of education received via television outside of a formal system.

3. *Course production for television.*—Experimentation with new institutional forms, like Children's Television Workshop, that can create high-quality materials for the new media; creation of new courses based primarily on the new media, including combinations of the computer and television.

4. *Games and simulations.*—Studies of and development of various forms of games and simulations for instructional uses; investigations of strengths and weaknesses.

5. *Instructional environment.*—Studies of desirable environments for learning; design of improved buildings and equipment.

PROGRAM ELEMENT III-5: INCREASING THE EFFECTIVENESS OF ANALYTICAL TOOLS AND METHODS

Topics of Concern

Many educational and education R&D activities depend on analytical and research methodologies provided by the computational and logical sciences: mathematics, statistics, philosophy, and computer science. Some effort should be devoted by the NIE to the encouragement in these sciences of developments needed in education. Among the areas the NIE might support are:

1. *Statistical techniques* for the estimation of complex, multi-variable, time-dependent relationships when many independent variables are highly correlated, such as those that obtain in many educational systems.

2. *Computer-based techniques* for storage and retrieval of large quantities of data on individuals, under proper security and privacy safeguards, and for convenient analysis of those data.

3. *Logical analysis of fundamental concept of measurement.* Study of categories of measures; their proper roles; their characteristics; and fallacies of measurement.

PROGRAM ELEMENT IV-1: DEVELOPING A SUPPLY OF COMPETENT R&D MANPOWER

Types of Activity

A significant impediment to further development of an effective system of education R&D is the insufficient availability of appropriately skilled manpower. This is a problem not only of numbers, but also of maldistribution with respect to style (researchers, developers, evaluators), skill (psychologists, economists, operational analysts, historians), and situation (universities, Regional Laboratories, state and local agencies). The manpower development program of NIE should include activities intended to identify and redress these insufficiencies and maldistributions. Among the activities might be:

1. *Manpower requirements.*[1]—A group should be formed within the NIE to support and conduct studies of the needs of the educational R&D systems for manpower having various styles, skills, and situations and to develop programs intended to meet those needs. (This must be done in close conjunction with planning of the overall R&D program.)

2. *Training programs for state and local agency staffs.*—One severe deficiency of the existing R&D system is the insufficient number of staff members in state and local agencies who are able to enlist R&D competency in the service of educational practice. This could be overcome with the help of training programs aimed at the needs of such staffs.

3. *Development and evaluation specialist training.*—Another major deficiency is the shortage of individuals trained in educational development, evaluation, and other applied activities. The NIE might encourage joint programs between educational development and evaluation organizations and universities to train such specialists. Participation in development and evaluation activities should be an essential part of the programs.

4. *Postdoctoral fellowships.*—The field of education needs to attract the close attention of a wide range of skills and disciplines. One way to expand quickly the number of highly trained individuals who are knowledgeable about and interested in education might be to offer postdoctoral fellowships to qualified individuals with doctorates in relevant fields such as psychology, economics, sociology, or computer science. The fellowships would require residence at an institution having an active educational R&D program; many might be at the NIE itself.

5. *Doctoral fellowships.*—An expanded program of fellowships to graduate students training for educational R&D might be undertaken. These should, however, be tied closely to the existence of high-quality R&D activities at the training institution *and* participation by the fellows in those activities. These fellowships should be available to students with interests in education in any school or department of the university.

6. *Special training programs.*—Certain manpower needs might best be met through apprenticeships, on-the-job training, or short-term intensive training programs at full salary.

[1] No specific cross-references are provided for activities in Program Area IV.

PROGRAM ELEMENT IV-2: DEVELOPING A SUPPLY OF EFFECTIVE R&D INSTITUTIONS

Types of Activity

Another impendiment to development of an effective system of education R&D is the inadequacy of the existing institutional framework for the conduct of R&D. There are not enough organizations with the interest and capacity to work on developmental, experimental, and problem-solving activities, either in independent or in education-agency settings: There are too few sites where critically sized. interdisciplinary teams can be formed to work on complex educational problems. The institutional development program of the NIE should include activities intended to identify and overcome such deficiencies. Among its activities might be:

1. *Institutional requirements.*—The group concerned with manpower requirements should also consider the availability of and need for appropriate institutional settings and should recommend programs intended to overcome deficiencies.

2. *Institutional development.*—After appropriate study, the NIE might identify the need for certain new institutions. Its role might then be to catalyze their formation through planning and start-up support. The major portion of continuing support, however, should be intended to come through other NIE programs. Among the kinds of institutions that might be begun are:

Large, interdisciplinary centers for the study of educational problems.

Problem-solving organizations to serve the needs of consortia of state or local educational agencies.

Centers that develop and maintain large data bases of widespread value to educational research. These might be data on groups of students or on institutions followed over many years or they might be large survey files.

Production organizations for high-quality television or computer-based instructional materials (on the model of Children's Television Workshop, the producers of *Sesame Street*).

Demonstration schools and associated teacher centers to bring new educational practice to local schools through close association with local teachers and administrators.

Additional R&D Centers and Regional Laboratories. There still exists the need for university-based, interdisciplinary research centers and for institutions emphasizing educational development.

3. *Institutional support.*—Some existing R&D institutions might require and warrant support beyond that available to them from other specialized NIE programs. It may prove desirable to enable those institutions that have demonstrated competence and productivity to develop new ideas, refine old ones, and fill in the gaps in their programs through provision of institutional support, on the model of programs of other Federal agencies, especially the NIH.

PROGRAM ELEMENTARY IV-3: STRENGTHENING THE LINKAGE BETWEEN R. & D. AND PRACTICE

Types of Activity

Clearly one of the most serious problems of the educational R&D system is its failure to establish close and continuing linkages between the R&D system and the educational agencies. A number of attempts of various kinds have been made in the past. Much greater effort will have to be made in the future.

There appears to be no single, simple action that will solve this problem. It is a systemic one and will only yield to a wide variety of actions at many places in the system. Many of them have been included in other program elements throughout this program description. Among them are:

The concept of problem-focused program elements, whose very goal is the linkage between R&D and practice.

The involvement of members of the operating education community in advisory committees and task forces, and their service as temporary NIE staff members.

The activities intended to place R&D-trained personnel in problem-solving positions in state and local agencies.

The training program for state and local personnel.

But there may be some activities that should be undertaken solely with the intention of strengthening the linkage between R&D and practice. Among the possibilities are:

1. *Support for state and local R&D.*—An experimental program might be undertaken in which the NIE (and OE) provide support (perhaps on a matching basis) to state and local agencies to enable them to conduct or contract for R&D in support of their own perceived needs.

2. *State and local R&D needs.*—The NIE could undertake or support a study of the needs for R&D at the state and local level, both as they are perceived by practitioners and as those familiar with R&D see them. A similar study might be undertaken for colleges and universities.

3. *State and local R&D activities.*—A study might be done of the extent to which R&D has been and currently is being used in educational agencies.

4. *Comparative analyses.*—Two categories of experience in the use of R&D should be examined for relevant lessons. They are:

The experience of other sectors of the economy—agriculture, health, industry, space, and defense.

The experience of other countries—Great Britain, Sweden, Japan, the Soviet Union, Canada—with educational R&D.

5. *Mechanisms for implementation.*—Careful studies must be undertaken of the impediments to innovation within the education system. At the same time, experiments with a variety of mechanisms for facilitating implementation should be undertaken. These would include:

Far greater involvement of the teacher in educational R&D activities. The British experience with local Teacher Centers for curriculum and examination development should be used as one guide in the development of American models.

Use of the organized teaching profession as a means of disseminating and encouraging innovation.

Local and regional demonstration schools in which innovative practices are used. These schools would accept teacher visitors, for short or long stays, to acquaint them with the new practices. The schools would have special innovation staffs who would visit schools in the region helping to introduce the new practices and who would conduct courses and seminars.

PROGRAM ELEMENT IV–4: DEVELOPING STRUCTURES FOR INFORMATION TRANSFER

Types of Activity

Effective R&D depends on effective information transfer within the R&D system. New findings must flow freely and directly among those who are pushing forward the frontiers of knowledge or developing ways to put that knowledge into practice. (The flow of information between R&D and practice was discussed in the previous program element.) The established scientific disciplines have evolved and are continuing to evolve effective formal and informal networks for information flow. Professional societies, scientific journals, books, scientific conferences, and "invisible colleges" are the principal mechanisms for exchange. The newer disciplines and areas of concern and, especially, the applied sciences and technologies are less well-served. Serious deficiencies in information flow exist in the field of education. Some deficiencies have to do with the quality of the information transferred; the noise drowns out the clear signals. Some deficiencies have to do with the absence of certain branches in the network; researchers in different disciplines do not communicate, even when concerned with the same problem. Some deficiencies have to do with the access to existing information; many reports never enter the accessible literature. A number of efforts are under way to alleviate these problems. The NIE should, in cooperation with OE's National Center for Educational Communication (NCEC) and the NSF, undertake additional efforts to facilitate the flow of useful information within the educational R&D system. Among its activities might be:

1. *Professional societies.*—The NIE might provide assistance to professional societies in the development and support of journals, conferences, and other means of information exchange, especially those means that strengthen scientific review procedures within the societies.

2. *Information systems.*—Reference systems should be continually refined and improved. More attention might be paid, for example, to gathering and providing data on investigators, institutions, and projects.

PROGRAM ALTERNATIVES

In developing an example program for the NIE, a number of alternative program structures were considered and rejected. The principal ones were:

Educational Problems.—All R&D activities would be undertaken as part of comprehensive programs addressing urgent educational problems.

Educational Levels.—The program would be divided first according to levels of education: preschool, primary, secondary, higher, vocational, continuing.

R&D Activity Types.—The first program division would be into the several types of R&D activity: research, development, experimentation, evaluation.

The advantages and disadvantages of each are described below.

Education Problems

The NIE will be distinguished by its central concern with R&D as a means of achieving educational improvement and reform. To a greater extent than most previous Federal educational R&D programs, it will focus its attention on the solution of major educational problems. This study has suggested that about 50 percent of its program, that contained in Program Area I, be devoted to such activities. Some, however, have argued that virtually all of the program should be so directed. The *advantages* they see are:

Concentration of educational R&D's limited resources on the vital issues facing the education system.

Strengthened ability to convey to executive and legislative authorities, to the education system, and to the public the relevance and importance of educational R&D to educational needs.

A considerable amount of basic research (rather than strictly problem-oriented work) could be carried out as part of a full-scale attack on problems of flexible definition and broad scope.

However, the *disadvantages* include:

The prospect that short-term, problem-oriented activities would, in practice, drive out longer-term, knowledge-building activities, to the eventual detriment of the ability of education to develop better problem solutions.

The likelihood that the sum of the activities devoted to improving educational practice, strengthening its foundations, or building the R&D system undertaken as part of problem-oriented programs would not constitute adequate national programs in those areas.

The danger that an entirely problem-oriented program would raise the expectations of achievement too high and would not convey honestly to the various constituencies the need to build the tools, foundations, and R&D system of education if real improvement is to be achieved.

As the NIE matures, the balance of resources going into problem-oriented activities may shift. However, it seems advisable in the early years explicitly to include other kinds of activities such as those in Program Areas II, III, and IV, in the program so that the balance may be explicitly determined on the basis of experience.

Educational Levels

Educational studies are conventionally divided according to levels: elementary and secondary education is the concern of one set of organizations and R&D personnel; higher education is the subject of another; preschool education, still another; and so on. Convention would suggest, therefore, that the NIE's program also be divided according to those educational levels.

The *advantages* of such a program structure would be:

Correspondence with the organization and administration of formal education, with the structure of many professional societies and education interest groups, and with the organization of concerned Federal agencies, such as the OE and NSF.

Improved capacity to recognize differences in educational problems and practices at different levels of education.

The *disadvantages*, however, would be:

Perpetuation of distinctions and barriers that in many cases are unnecessary or inappropriate.

An implicit focus on existing formal systems of education would be imposed.

No doubt the NIE will want to address problems and practices that are specially relevant to one or another level of education, but it can do so within the program structure that has been suggested, when and as such a view is appropriate. It need not view all problems within such a framework, however, as it would have to were an educational-level structure to be adopted.

R&D Activity Types

The several types of activities that R&D comprises each have special requirements in terms of specification, staffing, and management. Basic research activities, for example, are generally best specified by the scientist who is to perform them, without detailed guidance from the funding agency. Large-scale development activities, however, may be better specified by groups that represent the eventual user as well as the developer, and carried out by developers who accept closer scrutiny by the funding agency. This suggests that an R&D program might usefully be divided according to the types of R&D activity.

The *advantages* of such a program structure are:

Its correspondence with the organization and administration of much educational R&D.

The ease with which each type of R&D could be specified, staffed, and managed in ways that are appropriate for it.

The *disadvantages* of organizing the program in this way include:

The difficulty of organizing and managing a comprehensive program including several types of R&D activity addressing a major educational problem.

The introduction of unnecessary and inappropriate barriers between the several stages of R&D.

The reduced ability to explain to administrative, legislative, and other constituencies the importance and relevance of the R&D program to educational needs.

The program structure proposed in this study does recognize the need to specify and manage the several types of R&D differently. This is explained in further detail in the next chapter. But it seems neither necessary nor desirable to let that recognition become the organizing principle for a program of studies whose primary objective is to improve education.

IV. ORGANIZATION

The design of institutions is an art, not a science. This is especially true for R&D institutions. The art is an important one, however, for an institution's structure can facilitate creativity or impose docility; it can encourage continuous self-renewal or induce unresponsive rigidity; it can make communication and coordination easy or introduce unnecessary barriers. Program may be primary, but organization is what determines how well the program will be carried out.

Institutional design need not be entirely intuitive. There is, for example, a considerable amount of experience with R&D organizations that is relevant to the design of the NIE. And some study has been made of the principles of R&D management and organization design outside and within the Federal government. Finally, many individuals have had long experience with R&D management, educational R&D, and the combination of the two. Their intuition and judgment are valuable. The organization for the NIE described in this chapter has drawn heavily on those sources. It is specifically designed to implement the program discussed in the previous chapter.

This proposed organization, however, *is only an example of what the NIE might become.* Like the other specifics of the Institute, the organization should be defined finally by the Director, his staff, and the advisory panels. Moreover, it should reman flexible enough to adapt to changing circumstances and opportunities. This proposed structure, thus, serves to explain, in detail, one way in which the NIE might carry out its program.

OVERALL ORGANIZATIONAL STRUCTURE

The major proposed structural features of the NIE are displayed in Figs. 1 and 2. In Fig. 1, the NIE's location within the Department of Health, Education and Welfare is shown; Fig. 2 indicates the NIE's major internal substructures.

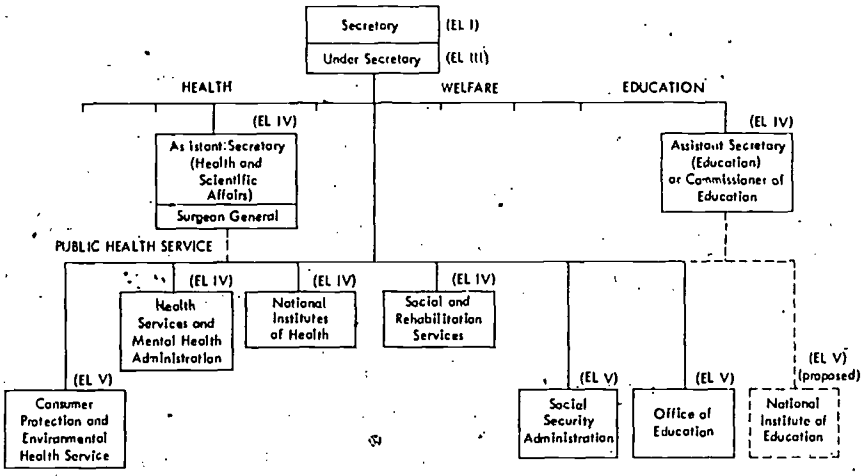

Fig. 1—Location of National Institute of Education Within the Department of Health, Education and Welfare

(The Executive Level of the director of each agency is indicated alongside the corresponding box; the range of executive grades is from EL I to EL V, EL V being the lowest)

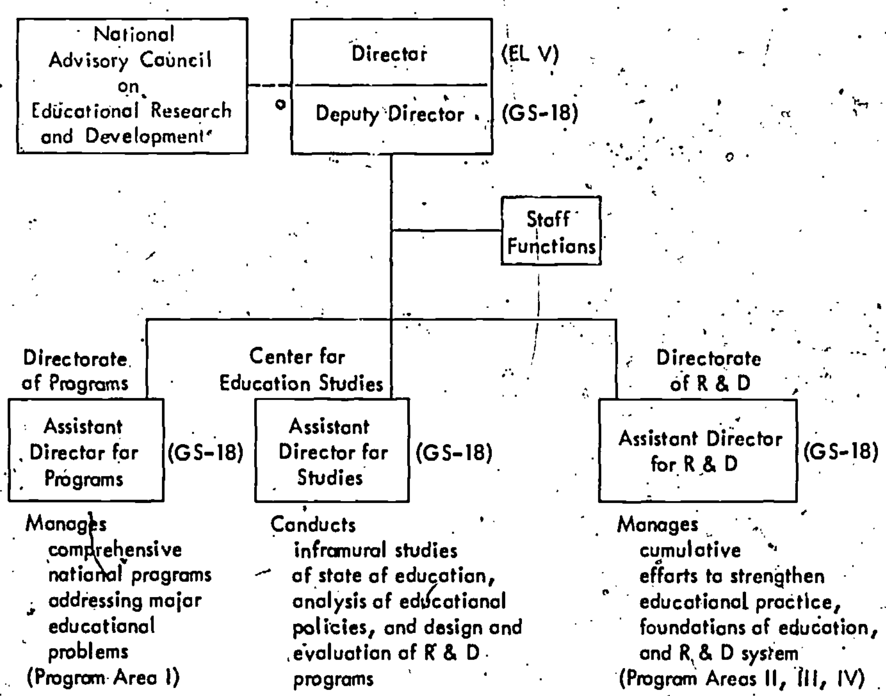

Fig. 2—Major components of the National Institute of Education

In summary, the NIE would be

A separate agency within HEW,

Parallel to the OE,

Reporting to the Secretary of HEW through his designee, and

Led by a *Director* at Executive Level V, like the Commissioner of Education at present.

Its administration would be provided by

The *National Advisory Council on Educational Research and Development*, which would assist in setting general policy, and

The *Director*, who would be responsible for continuous administration of the Institute's policies and programs.

The internal structure of the Institute corresponds to the structure of its programs. It comprises

A *Directorate of Programs*, headed by an Assistant Director for Programs, responsible for development and management of comprehensive national programs that address major educational problems (Program Area I);

A *Directorate of Research and Development*, headed by an Assistant Director for Research and Development, responsible for development and support of coherent, cumulative efforts to strengthen educational practice, the foundations of education, and the educational R&D system (Program Areas II, III, IV);

A *Center for Educational Studies*, headed by an Assistant Director for Studies, responsible for conduct of a program of studies of the state of education, analyses of educational problems, and design and evaluation of R&D programs (Intramural Studies); and

The usual *staff functions* for administration and communication.

The following sections discuss each of these structural features of the NIE in greater detail.

POSITION WITHIN HEW

As Fig. 1 shows, establishing the NIE as a separate agency within HEW with an Executive Level V Director would raise it to a position parallel to the other HEW operational agencies: the *welfare* agencies (Social Security Administration, Social and Rehabilitation Service), *health* agencies (Health Services and Mental Health Administration, NIH, and Consumer Protection and Environmental Health Service), and one other *education* agency (the OE).

There are three reasons for recommending this position within HEW:

1. To provide the NIE with the *stature within the Federal government* that will enable it to "link the educational research and experimentation of other Federal agencies . . . to the attainment of particular national goals" and to provide strong leadership for the nation's program of educational R&D.

2. To enable the NIE to establish a *personnel and salary system* that will be adequate to attract and retain the necessary managerial and professional personnel.

3. To demonstrate the *nation's commitment* to a strong and effective program of educational R&D.

Stature Within Government

At the present the stature of the OE's R&D arm within the Federal government is low in relation to that of comparable agencies. That arm, the NCERD, is authorized to have a GS-17 Director. He reports to the GS-18 Deputy Commissioner for Development, who reports to the Level V Commissioner of Education, who reports to the Secretary of HEW. In contrast, the directors of the R&D arms of the other agencies in the Federal government having a concern with education hold GS-18 or Executive Level positions, as is shown in Table 5. The Assistant Director for Education of the NSF, for example, holds a Level V position. The Assistant Director for Planning, Research, and Evaluation of the Office of Economic Opportunity now holds a Level IV position. Both of these men report directly to the heads of their agencies. Both are also managing vigorous and effective programs of educational development and experimentation.

Table 5.—Status of Research and Development in Other Federal Agencies Concerned with Education

Agency:	Level
National Science Foundation:	
Director	EL II
Assistant Director for Education	EL V
Office of Economic Opportunity:	
Assistant Director, Planning R. & D	EL IV
Director, Research, and Evaluation	EL V
National Institutes of Health, HEW:	
Director	EL IV
Director, National Institute of Child Health and Human Development	GS-18
Office of Child Development, HEW: Director	GS-18
National Foundation on Arts and Humanities: Chairman	EL III
Department of Labor:	
Assistant Secretary for Policy Evaluation and Research	EL IV
Assistant Secretary for Manpower	EL IV

TABLE 6.—*Status of research and development in other departments*

Agency:	Level
Department of Transportation: Assistant Secretary for Research and Technology	EL IV
Department of Commerce:	
Assistant Secretary for Science and Technology	EL IV
Director, National Bureau of Standards	EL V
Department of Agriculture:	
Director, Science and Education	EL V
Administrator, Agricultural Research Service	EL V

Table 6 indicates the status of R&D in the other nospace, nondefense Federal departments having R&D programs. In each case, the Director is Level V or above.

If the NIE is to provide strong and effective leadership to the national program of educational R&D, it and its Director should be able to speak at least as equals to the other concerned agencies in the councils of government. This means that the Director should be no lower than Executive Level V.

Personnel and salary system

As Table 7 indicates, the current supergrade management structure for educational R&D in the Office of Education has very few high-level positions in comparison with those of the NSF and the NIH. This relative deficiency remains even when the numbers are corrected for budget size. The NSF has 5 times the budget of the NCERD and 13 times the number of supergrade management personnel; the NIH has 17 times the budget and 28 times the personnel. If all supergrade personnel are included, not just those in management positions, the comparison is even more stark: the NSF has 36 times as many supergrades; the NIH has 58 times as many.

TABLE 7.—SUPERGRADE MANAGEMENT PERSONNEL OF NCERD, NSF, AND NIH

Level	OE-NCERD	NSF	NIH
EL II		[1] 1	
EL III		1	
EL IV			[1] 1
EL V		5	
GS-18		11	48
GS-17	[1] 1	32	26
GS-16	2		10

[1] Director.

These differences lead to important differences in the ability of the three agencies to attract and retain high-quality management and professional personnel. The NCERD is at a disadvantage not only in competing for personnel with industry, university, and nonprofit agencies, but also in competing for high-quality personnel with *other government R&D agencies concerned with education and*

related fields. If the NIE is to develop and implement a strong program of educational R&D, it must be able to recruit and retain absolutely first-class staff. To do so, it will need a personnel structure that includes many more supergrades, GS-16 through GS-18, or equivalents, than NCERD has had. The same reasoning leads again to the desirability of a Director at Executive Level V or above.

National Commitment

The final reason for recommending that the NIE be a separate agency is the symbolic importance of that stature both within government and outside of it. This is at once the least concrete and the most important of the reasons for establishing a separate national agency for educational R&D.

Creation of the NIE would symbolize to the education and the R&D communities the importance that the Federal government and the nation ascribe to educational improvement and reform through R&D. It would be a clear statement that concentrated application to education of the wisdom and talents of the nation's most highly qualified scientists and innovators is needed and desired. It would raise the creation of new knowledge about education to the stature now accorded to studies of health, symbolized by the NIH. It would increase the visibility of the educational R&D system and, thereby, the ability to attract new personnel to the field and to gain the attention of educators.

Possible Problems

Separating the agency having responsibility for management and support of the national educational R&D program from the OE may also introduce some problems. The most evident one is the possible introduction of new bureaucratic impediments to coordination with the OE. This could be a real cost. However, despite the lack of such barriers, the current situation, until recently, has not been one of close coordination between NCERD and the other OE bureaus. Achievement of such coordination depends more on positive actions to introduce joint planning, transfer of information, and shared program responsibility than it does on joint residence within the same organizational box. *But to insure that such positive actions are taken, both the OE and the NIE should report to the same official designated by the Secretary.* In the initial proposal this was intended to be the Assistant Secretary for Education. An alternative, preferable in many regards, would be to delegate the authority to the Commissioner of Education, perhaps at the same time appointing or raising him to a Level IV position.

Alternatives

Since there have been a number of other recent proposals for reorganizing the Federal education agencies, it may be useful to review some of the alternatives to the proposed position of the NIE within HEW and to identify their differences and similarities.

Figure 3 is a schematic diagram of the underlying structure of the Federal education agencies, independent of the names of the various agencies and the titles and levels of their directors. One subagency is the manager of Federally sponsored (or conducted) educational R&D programs. The other subagency manages Federal programs of educational assistance—the various categorical and general-aid programs. Both report to a principal Federal education officer, who reports to the Secretary of HEW, and who heads the Federal education agency.

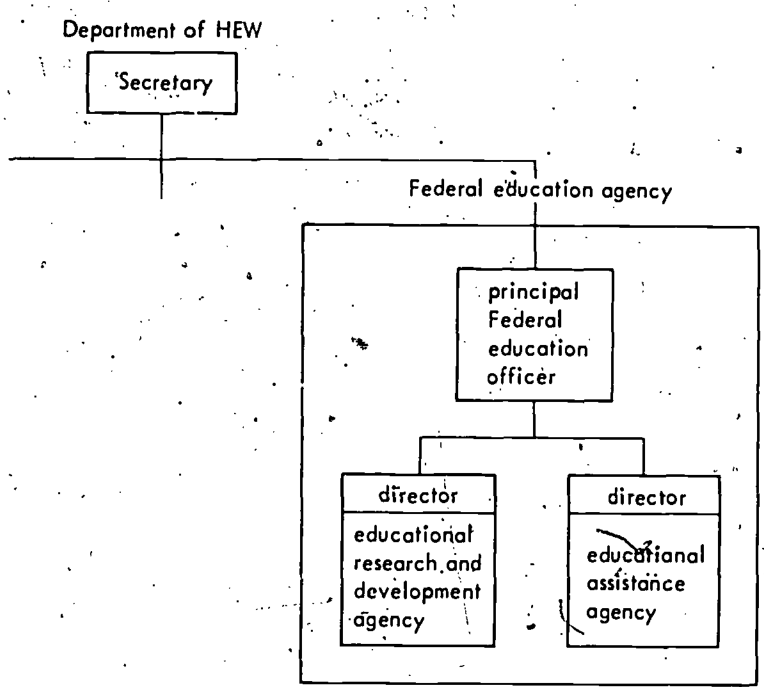

Fig.3—Schematic diagram of education agencies within HEW

All the major proposals for reorganizing the Federal education agencies conform to this general scheme (with the possible exception of the proposed Department of Education, whose Secretary might not report to the Secretary of HEW). The differences lie not in whether or not a separate agency is charged with responsibility for R&D, but in the names of the various agencies and the titles and levels of their Directors, and in the differences in stature and adherence to tradition that they represent.

TABLE 8.—THE PLACE OF R. & D. WITHIN ALTERNATIVE FEDERAL EDUCATIONAL ORGANIZATIONS

Alternative	Federal education agency	Principal Federal education officer/level	Educational R. & D. agency	Director, educational R. & D. agency	Educational assistance agency	Director, educational assistance agency
Current	Office of Education	Commissioner, EL V	NCERO	Director, GS-17	Bureaus of OE	Deputy Commissioners, GS-18.
1		Commissioner, EL IV	NIE	Director, EL V	Office of Education	Director, EL V.
2		Commissioner, EL III	NIE	Director, EL IV	do	Director, EL IV.
3	Office of Education	Commissioner, EL IV	NIE	Director, EL V	Educational Assistance Administration.	Director, EL V.
4	do	Commissioner, EL III	NIE	Director, EL IV	do	Director, EL IV.
5	Department of Education	Undersecretary, EL III	NIE	do	Office of Education	Commissioner, EL IV.
		Secretary, EL I	NIE	do	Educational Assistance Administration.	Director, EL IV.

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The major proposals are summarized in Table 8 as a listing of agency names, position titles, and position levels. The current situation appears first in the table, for comparison. Currently, the overall Federal education agency is called the Office of Education and is headed by the Commissioner of Education, presently at EL V. The R&D subagency is NCERD, headed by a GS-17 Director. The assistance subagency comprises the major Bureaus of OE, grouped into units headed by Deputy Commissioners. The arrangement suggested in this report is shown as Alternative 1. The assistance subagency retains the name Office of Education but has a separate Director (at EL V) who reports to the Commissioner (raised to EL IV). Another possibility would be for the Commissioner to retain direct responsibility for OE. Some reviewers of the draft of this report have suggested that the evidence supports the suggestion shown in Alternative 2: an NIE Director at EL IV reporting through a Commissioner raised to EL III. In neither of these alternatives does the combination of the two subagencies receive an agency name. Alternative 3 is the same as Alternative 1 except that the combination of the two subagencies is called the Office of Education and the educational assistance subagency receives a new name, for example—Educational Assistance Administration. Alternative 4 modifies Alternative 2 in the same way. Another current proposal affecting the Federal education agencies is that HEW have three undersecretaries, one for each of its major areas of concern. With such an arrangement, Alternative 5 appears feasible: no separate name for the combined education components of HEW; the educational assistance subagency retains the Office of Education name; the principal Federal education officer is the Undersecretary for Education. Finally, several individuals and groups have been urging creation of a separate Department of Education. In one variant it would be a subcabinet department within HEW like the Army, Navy, and Air Force within DoD; in the other variant it would be a cabinet-level department. In either case, Alternative 6 would be a feasible arrangement: the NIE and Educational Assistance Administration (each headed by EL IV Directors) both report to the Secretary of Education.

As these alternatives reveal, the location of NIE within HEW and its association with whatever agency is called the Office of Education will not necessarily be resolved solely on the basis of planning for the NIE. Other possible changes within HEW may affect the outcome. But it is also important to remember that many of the differences among the alternatives are matters of names, titles, and levels. The administrative qualities of the NIE that are essential for its success should be achievable under any one of the alternatives. The essential qualities are: a director of at least EL V and adequate numbers of super-grade positions, a flexible personnel authority suited to the needs of hiring first-class R&D personnel, the authority to conduct intramural research, financial authority and administrative arrangements suited to the special needs of managing R&D insulation from the pressures and shifting priorities associated with large educational assistance programs, and a separate identity and visibility.

NATIONAL ADVISORY COUNCIL ON EDUCATIONAL R&D

Advisory councils may be figureheads or helmsmen, public fronts or private backers. The choice is made in part by how they are constituted, in part by how they are used. In the case of educational R&D, it appears important to establish an Advisory Council that can exert real influence over policy and priorities. There are two reasons:

1. The history of educational R&D has been one of rapidly fluctuating policies and priorities. Perhaps no complaint is heard more frequently from those who have worked in educational R&D than that the programs and preferences of Federal support for educational R&D change continuously as personnel, political pressures, and administrations come and go. The stability and continuity of effort essential to cumulative, coordinated R&D programs is difficulty to achieve under such circumstances. A distinguished National Advisory Council could play a large role in establishing and maintaining appropriate R&D policies and priorities.

2. Many forces and interests have a legitimate concern with educational R&D and will wish to insure that their points of view receive adequate representation in the NIE's Councils. Its many advisory and scientific panels will serve these needs in part. But to insure that the compound of those concerns is not simply a miscellany of projects, there needs to be a final group that can set priorities and make choices. The director would, of course, exert a major influence. But

the deliberations of a representative National Advisory Council would give such hard choices a legitimacy and authority that no individual's choices could achieve.

In order to exercise these responsibilities the Council should be constituted as follows (items with an asterisk are included in the pending NIE legislation):

Responsibilities

*1. To advise the Director of the Institute and the Secretary of HEW in the establishment of general policy for the Institute and *in the development of its program*. (The last provision is not included in the pending NIE bill.)

*2. To review the status of educational R&D in the United States and advise the Director and the Secretary on ways of improving the education R&D effort.

*3. To present an annual report on the current status and needs of educational R&D to the Secretary, for transmittal to the President.

4. To make recommendations to the President with respect to appointment of the Director of the NIE.

Membership

1. Members of the Council should be appointed by the President for staggered *six-year terms*, one-third of the terms expiring every two years. (One-third of the first Council would serve for two years; one-third for four years; one-third for six years.) With the exception of the first members, members should serve no more than one term. Vacancies should be filled for the remainder of the term of the predecessor.

2. There should be *twenty-four* appointed members of the Council. In addition, the NIE Director should serve on the Council, ex officio.

3. Members of the Council should be chosen on the basis of achievement and service in the fields of R&D, education, or public affairs. They should be so selected as to provide wide representation of the views of educators, the R&D community, and the public.

Staff and Studies

*1. The Council should employ a staff of *no more than five professionals* to assist in carrying out its responsibilities. (The staff limitation is not in the pending NIE bill; it is similar to a provision governing the staff of the National Science Board.)

2. The staff should be directed by an *Executive Secretary*, responsible for developing issues for consideration by the Council.

*3. The Council should be able to enter into contracts for studies necessary to the discharge of its duties.

The recommendations with regard to the Council's *responsibilities* follow very closely the provisions in the pending NIE bill. However, two responsibilities have been added here. The first is to advise on the development of the program. The reasoning behind this addition has been noted above. The second is to make recommendations with respect to appointment of the Director. The choice of Director is so crucial to the success and credibility of the Institute that it appears desirable that his choice be informed by the deliberations of the Council, as representatives of education, the R&D community, and the public.

The recommendations with regard to the Council's *membership* are modeled on membership provisions for the National Science Board, which has successfully guided the growth of the NSF. The emphasis is on the need to achieve *stability*, *legitimacy*, and *representativeness*. The provisions of the pending bill, calling for fifteen members for three-year terms, seemed to encourage too high a rate of turnover and to provide for too few members to achieve adequate representation of the many points of view in education. The statement of qualifications is intended to emphasize the need for legitimacy in the eyes of the many concerned communities.

The recommendations with regard to *staff and studies* are intended to give the Council the tools to be an active participant in policy setting. Frequently, advisory councils are left dependent for the necessary work on the agencies they must advise.

DIRECTOR-DEPUTY DIRECTOR

The selection of a Director will undoubtedly be the most crucial decision to be made during the creation of the NIE, for he will have to select the major staff members, establish major program directions in conjunction with the National Advisory Council, and convey the nature and content of the Institute's activities

to its several constituencies. To assist him in these activities, he will need a Deputy Director whose strengths complement his own.

To provide the necessary leadership, the Director should have the following responsibilities and conditions of appointment:

Responsibilities

1. To establish general policy and set program priorities, in conjunction with the National Advisory Council.
2. To select and appoint the principal staff members and officials, including the Deputy and Assistant Directors.
3. To determine the allocation of the Institute's budget to its several programs after consultation with the National Advisory Council and the Deputy and Assistant Directors.
4. To review and approve major Institute programs and to assume responsibility for their quality.
5. To organize and structure the Institute so that it can best execute its responsibilities.
6. To report on the Institute's program and operation to the Secretary of HEW, and, through him, to the President; to the Congress; and to the education and R&D communities and the public.

Conditions of Appointment

*1. The Director should have a rank of Executive Level V in the Federal Executive Schedule.

*2. He should be appointed by the President and confirmed by the Senate, to a *renewable term of six years*, unless removed by the President. (The six-year term is not provided in the pending bill.)

3. A slate of qualified nominees for the directorship should be presented to the President by the National Advisory Council before the appointment is to be made.

4. The Director should report to the Secretary of HEW through the Secretary's designee.

5. The Director should serve as a member of the National Advisory Council.

The statement of *responsibilities* makes it clear that the Director has authority for the Institute's general policy, priorities, staff, budget, program, organization, and representation before constituencies.

The *conditions of appointment* reflect the recommendation, discussed earlier, that the Director have a rank appropriate to his responsibilities and authority. A term of six years is set so that the Director's performance might be reviewed regularly, but at an interval long enough to encourage stability and insulation from short-term political pressures. The other recommendations have been discussed earlier.

The Deputy Director should have the following responsibilities and conditions of appointment:

Responsibilities

1. To carry out such duties as the Director, with the approval of the National Advisory Council, may prescribe.
2. To act as Director of the Institute if the Director is absent or disabled, or if there is a vacancy in the office of Director.

Conditions of Appointment

1. The Deputy Director should have a rank of GS-18 or equivalent.
2. He should be appointed by the Director.

These responsibilities and conditions of appointment are conventional.

DIRECTORATE OF PROGRAMS

The work of the Institute must be accomplished through its three constituent organizations: the Directorate of Programs, the Directorate of Research and Development, and the Center for Education Studies.

The cutting edge of the Institute's program, and the characteristic that distinguishes it from prior educational R&D efforts, is its development and management of comprehensive programs directed toward the solution of major educational problems. The responsibility for these activities, which should employ around 50 percent of the Institute's resources (between $50 million and $70 million initially), would be with the Directorate of Programs; its organization is shown in Fig. 4.

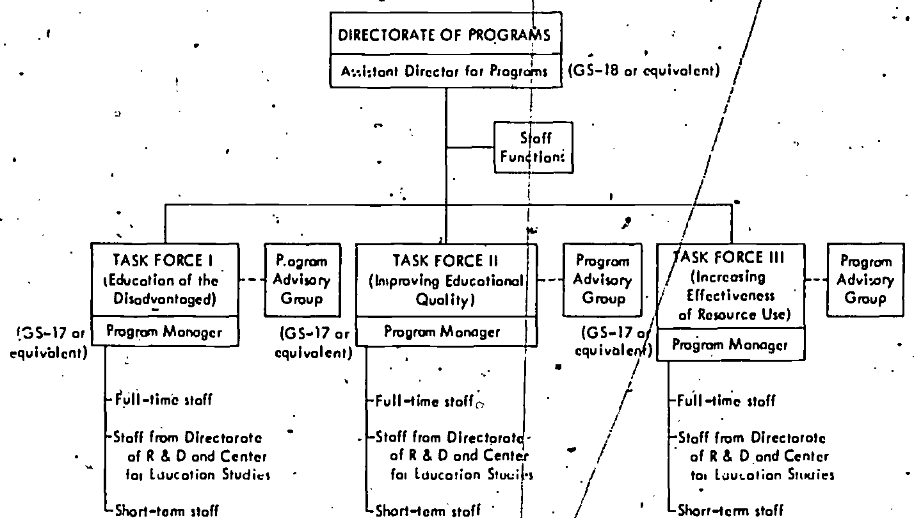

Fig. 4—Internal Organization of Directorate of Programs.
(Task Force names are illustrative only)

To carry out its responsibilities, the Directorate would have the following functions and staff structure:

Functions

1. To identify systematically and describe major educational problems and opportunities in conjunction with the Center for Education Studies.

2. To organize and manage comprehensive national programs of research, development, experimentation, evaluation, and innovation directed toward the solution of major educational problems.

Staff and Structure

1. The Directorate of Programs would be headed by an *Assistant Director for Programs*, who would hold a rank of at least GS–18 or equivalent and be appointed by the Institute Director. He would be responsible for major staff assignments and budget allocations within the Directorate, and for the quality of his programs.

2. A *task force* would be formed for each major problem to be addressed by the Institute. Each task force would be headed by a *program manager*, who would hold a rank of at least GS–17 or equivalent and be appointed by the Assistant Director for Programs. He would be responsible for staff assignments and budget allocations within his task force, and for the quality of his programs.

3. Associated with each problem area and its task force would be a *program advisory group* comprising individuals from other government agencies, local and state agencies, the R&D community, and the public who have special concern with or knowledge about the problem area. The advisory group would advise the program manager and the Assistant Director of Programs on the design and conduct of the program and its association with practice.

4. *Members* of the problem task forces would be drawn from three sources:

Full-time staff in the Directorate of Programs, who would form the core of the task force;

Staff from the Directorate of Research and Development or Center for Education Studies seconded for part-time service; and

Short-term staff in the Directorate of Programs, brought on to serve on a specific task force to which they bring special knowledge.

A problem task force would organize and manage each comprehensive national program. *The activities in the program, however, would be carried out primarily*

under contract by external R&D agencies: universities, state and local education agencies, Regional Educational Laboratories, nonprofit agencies, and profit-making firms. Occasionally some activity might best be carried out at the Center for Education Studies. Occasionally, also, it might be sufficient to recommend to the Directorate of R&D that it include some activity or another among the activities it is supporting rather than undertake it specially as part of a task force's program.

The organization into problem-oriented task forces is recommended on two grounds. First, the task force is a *flexible organization.* It can be formed quickly, carry out its functions over a short or long period, and then be disbanded, its members going on to other assignments or back to their permanent organizational homes. It avoids institutionalizing today's problems as, for example, the establishment of problem-oriented institutes might do. Moreover, its size and staff composition can be matched to the problem's requirements. Task forces would remain in operation for periods of years.

Second, the task force is a means of facilitating *interaction and coordination* between work on the problems of education and work on educational practice and foundations. By assigning program officers from the Directorate of Research and Development to serve on task forces, the task force gains ready access to knowledge of the state of the art in relevant areas and, reciprocally, the program officers gain an appreciation of the practical requirements for improvement in educational practices and foundations. This use of task forces is an adaptation to the management of extramural R&D programs of the *matrix organization* that has been found to be a very effective structure for the managment of intramural R&D programs in industry and nonprofit research organizations. (A similar structure has been employed by NASA in the management of some of its programs.)

The program advisory group associated with each task force is intended to assure that the task force develops a program of activities responsive to the needs and realities of the intended beneficiaries.

To indicate how the task forces might function, consider one on education of the disadvantaged. It might have the following characteristics:

TASK FORCE I. EDUCATION OF THE DISADVANTAGED

Program Manager—full-time staff member

Staff—Several full-time *staff members* of the Program Directorate:

Program officers from the Directorate of Research and Development concerned with evaluation, instructional process teacher training, individual motivation, and group influences on motivation:

Fellows and other short-term appointees from universities and state and local education agencies; e.g., the Assistant Superintendent for Research from a large city, Dean of School of Teacher Education on leave, or a mathematician or scientist interested in education of the disadvantaged.

Program Advisory Group—Government officials, such as Associate Commissioner of OE for Elementary and Secondary Education, Director of Research and Evaluation at OEO. *Local and state education officials,* such as chief state school officers, superintendents, and school board members from urban and rural districts. *Educators,* such as principals and teachers from schools in disadvantaged neighborhoods. *R&D personnel,* such as psychologists and sociologists, curriculum developers, and policy analysts who have worked on the needs of the disadvantaged. *Representatives of the affected communities,* such as parents and community leaders from ghetto neighborhoods.

Activities—(1) Development of a comprehensive, coordinated, but adaptive, multiyear plan of attack on the problems of the disadvantaged, including interrelated research, development, experimentation, evaluation, and innovation activities. (2) Contracting with appropriate agencies to carry out the components of the plan. (3) Monitoring progress in carrying out the plan and changing it as appropriate. (4) Coordinating plans and activities with other R&D and operating agencies.

The eventual responsibility for assuring that the work of the task forces is competent and effective lies with the Assistant Director for Programs and the Director of the Institute.

DIRECTORATE OF RESEARCH AND DEVELOPMENT

The solid basis for the Institute's problem-solving activities is established by its programs intended to improve educational practice, strengthen education's foundations, and build a strong R&D system. The responsibility for the initiation and support of these activities, which should employ almost 50 percent of the Institute's resources (between $50 million and $70 million initially), would lie with the Directorate of Research and Development; its organization is shown in Fig. 5.

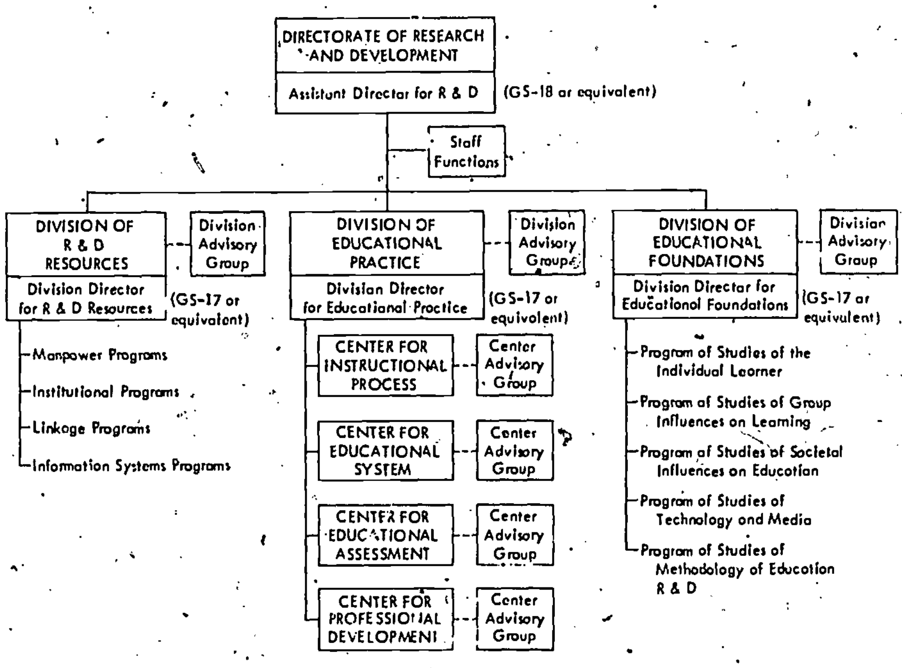

Fig. 5—Internal Organization of Directorate of Research and Development
(Center and Program names are illustrative only)

To carry out its responsibilities, the Directorate would have the following functions and staff structure:

Functions

1. To organize and manage coherent cumulative programs intended to improve educational practice.
2. To organize and manage coherent cumulative programs intended to strengthen education's scientific and technological foundations.
3. To identify the need for improvements in the educational R&D system and undertake programs intended to accomplish them.

Staff and Structure

1. Directorate of Research and Development would be headed by an *Assistant for Research and Development*, who would hold a rank of at least GS-18 or equivalent and be appointed by the Institute Director. He would be responsible for major staff assignments, for budget allocations within the Directorate, and for the quality of its program.
2. The Directorate would comprise three divisions, each headed by a division director:

Division of Educational Practice, headed by a *Division Director for Educational Practice*.
Division of Educational Foundations, headed by a *Division Director for Educational Foundations*.
Division of R&D Resources, headed by a *Division Director for R&D Resources*.

Each division director would be at the GS-17 level or equivalent and be appointed by the Assistant Director. Each would have responsibility for staff, budget, and program within his division. Each division would have a *Division Advisory Group* comprising ten to twenty distinguished individuals from education, R&D, and the public, with demonstrated competence or concern for the division's area of activity. The advisory group would assist the division director in establishing program priorities and overall policy.

3. The Division of Educational Practice would be divided in turn into a number of centers, one for each of the program elements in Program Area II. For example, there might be four centers initially:

Center for Instructional Process
Center for Educational System
Center for Educational Assessment
Center for Professional Development

The number might then expand or contract as appropriate. The centers would be intended to be more permanent than the task forces in the Directorate of Programs. Each center would be headed by a *Center Director*, a GS-16 or GS-17 position or the equivalent. The centers would support R&D activity in their fields of responsibility but would not conduct it. Each center would have a *Center Advisory Group* drawn from those distinguished educators and scholars with a direct interest and competence in the center's program area. The Center's professional staff would comprise both permanent members and a number of educators or scholars serving one- or two-year temporary assignments.

4. The Division of Educational Foundations would be divided into a number of *Programs of Studies*, one for each of the program elements in Program Area III. For example, there might be five programs of studies initially:

Individual Learner
Group Influences on Learning
Societal Influences on Education
Technology and Media
Methodology of Educational R&D

Each program of studies would be headed by a *Program Director*, at a rank of GS-16 or GS-17 or equivalent. The programs would sponsor, but not conduct, R&D in their areas of interest. The program professional staff would comprise both permanent members and scholars serving one- or two-year temporary assignments.

5. The Division of Research and Development Resources would be divided into a number of programs, one for each of the program elements in Program Area IV. For example, there might be four programs initially:

Manpower
Institutional
Linkage
Information Systems

The number could expand or contract as appropriate. Each program would be headed by a *Program Director*, at a rank of GS-16 or GS-17 or equivalent. The programs would develop fellowship, institutional grant, training, and other support activities intended to catalyze the formation of a strong R&D system in education. The Division Director and the Division Advisory Group would be expected to insure that the activities of these programs are coordinated with those of the other divisions and task forces so that manpower and institutional programs would respond to actual needs. The program professional staff would comprise primarily permanent members, with some school and college or R&D administrators occasionally serving temporary assignments.

The partitioning of the directorate into three divisions coincides directly to the program structure developed in the previous chapter, and within each division the subdivisions correspond to the program elements developed in that chapter. The only unusual provision is the recommendation that the subdivisions of the Division of Educational Practice be called Centers, while those in the other subdivisions be called programs or programs of study. This recommendation is made for two reasons: One, the need for coherent, comprehensive design and management of an R&D program is greater in those complex subject areas intended to affect practice than it is in either the fundamental research or system-building areas; two, these areas are central and continuing concerns of education and for symbolic and intellectual reasons should be associated with a specific continuing organization.

The project selection and funding decision could be handled differently in each division.

The Division of Educational Foundations might follow practices similar to those of NIH or NSF, in which scientific review panels for each program of studies would evaluate projects according to scientific merit; the ranked projects from each panel might then be combined in a single list that goes to the Division Advisory Group for final decisions. To avoid too ingrown a decision-making process, the scientific review panels should include specialists across a wide spectrum of disciplines and both younger and more senior scientists. The review panel on studies of the individual learner, for example, might include psychologists, anthropologists, biologists, linguists, and information scientists.

The Division of Educational Practice, however, might want to depend more on its own professional staff and center advisory groups to develop coherent R&D programs and then to seek appropriate performers. Only part of the program here might be developed according to the NIH or NSF model for basic sciences.

The Division of R&D Resources would probably want to use a variety of mechanisms ranging from fellowships to formula grants to institutional support programs. A variety of different review procedures will be appropriate. The key, however, will be to tie these activities to those of the other divisions, so that research training, for example, will be carried out in conjunction with research.

The program officers in each division would, of course, be expected to be professionally competent in the areas they support. In many cases this would mean a doctorate in a relevant research discipline or comparable R&D experience. In other cases it would imply considerable experience in innovative educational practice. Unless they achieve this kind of competence, their ability to participate in the encouragement and selection of useful R&D projects will be severely limited. To attract such individuals, two conditions must be satisfied: First, stature and salary comparable to that offered by positions elsewhere in government, education, and R&D must be offered; a personnel system comparable to those that have proved effective in NSF and NIH is desirable for this reason. Second, an environment of thoughtful, creative concern for education and of free, exciting interchange of ideas must be established. Part of this is provided by the natural communication among competent individuals; the NIE, however, will have two other features that will help to create this stimulating atmosphere.

First, the participation of program officers from this division on the problem-oriented task forces of the Division of Programs will not only bring together individuals from the two divisions, but will also establish links among officers within the R&D Division that might not occur otherwise. Moreover, it will provide the program officers with an exposure to a larger view of educational problems than they would ordinarily receive.

Second, the participation of program officers from this division in the intramural programs of the Center for Education Studies will keep them in touch with the frontier of education and educational R&D and give them opportunities to refresh their own R&D skills.

These two features of the NIE should help considerably in attracting first-class personnel to its staff, for both permanent and temporary positions.

CENTER FOR EDUCATION STUDIES

The NIE will not only develop and support educational R&D programs, it will also carry some out. The responsibility for these in-house activities will reside in the Center for Education Studies; its organization is shown in Fig. 6.

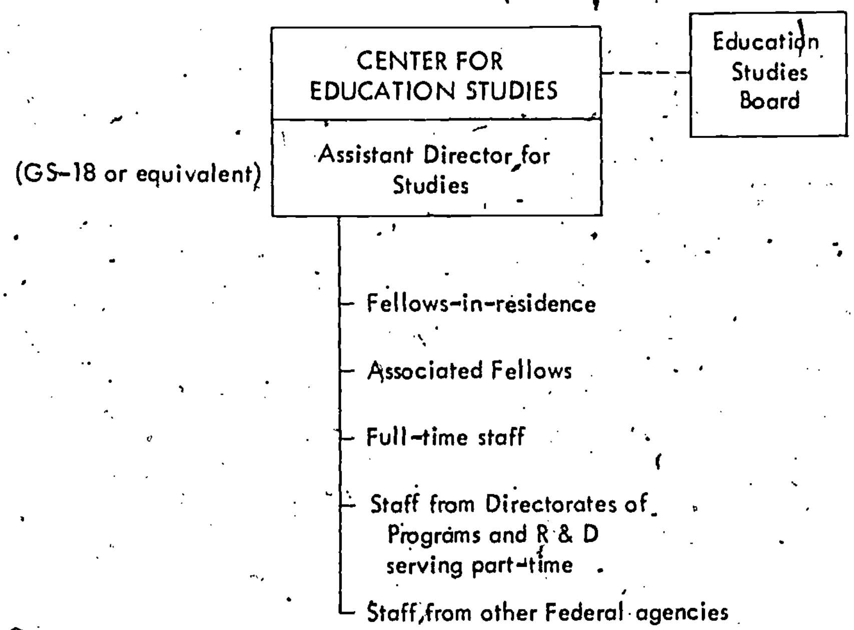

Fig. 6—Internal Organization of Center for Education Studies

To carry out its role, which should employ about 5 percent of the Institute's resources (between $5 million and $7 million initially), the Center should be constituted as follows:

Functions

1. To conduct a program of studies of the state of American education.
2. To carry out analyses and evaluations of educational policies.
3. To assist in the design and evaluation of educational R&D programs.

Staff and Structure

1. The Center for Education Studies would be headed by an *Assistant Director for Studies*, who would hold a rank of at least GS-18 or equivalent and be appointed by the Institute Director. He would be responsible for selection of staff and fellows, for the design and conduct of an appropriate and effective program, for coordination with the Directorates, and for budget allocations within the Center.

2. The internal structure of the Center would not be so formal as that of the Directorates. The basic unit of activity would be the *project*, each led by a *project leader* and varying in intensity from one man part-time to a dozen or more men full-time. Projects would form and reform according to the needs of the study effort and the competencies of the resident staff.

3. The professional staff would comprise five different groups:

Full-time staff of the center, who would be scientists, developers, and educators with a concern for broad questions of education and competence in studying them.

Staff from the other directorates, serving part-time as members of project teams to which they bring special knowledge and skills.

Staff from other Federal agencies, on a part-time basis, or full-time for a specified period, or indefinitely, to help in coordination of Federal programs.

Fellows, both junior and senior, who have been invited to spend from six months to two years at the Center.

Associate fellows, both junior and senior, who participate in the Center's projects on a part-time basis while retaining their normal outside affiliations.

4. The *Education Studies Board*, whose members would be distinguished scholars and practitioners of education, would advise the Assistant Director for Studies on the selection of fellows and on the program of studies at the Center.

The functions of the Center are intended to be those of thinking broadly and deeply about the problems, prospects, and goals of American education; of examining current educational policies and priorities; and of reviewing the quality and direction of educational R&D. Its method of operation would be to bring together distinguished educators and scholars, place them in an environment in which they can think freely and join forces naturally, and expose them to the major issues in American education. These scholars and practitioners, from a wide range of disciplines and operating experiences, would be brought together and allowed to mix to form teams and consider topics in a manner that is rarely achieved elsewhere. The result should be better understanding of and recommendations for American education.

To provide a continuity for the Center's efforts and a structure for its project activities, it might establish several major themes, on which work is always under way. Such themes might include the following:

Illumination of major educational problems: What is the extent and nature of the problems facing education? To what reality do the headlines correspond?

Evaluation of evaluation: What is the state of educational evaluation? How can it be improved? How can it be more closely related to educational objectives?

Educational goals: What might the goals of education be? How can each community establish its own? How do they relate to state and national goals?

Educational policies: How effective are current Federal educational policies? How might they be improved?

Educational R&D: What is the state of educational R&D? What are its deficiencies? How can it be improved?

The staff of the Center is intended to be chosen on the basis of accomplishments and promise in educational R&D or practice. The intent is to bring together in a single place scholars and practitioners, social scientists and technologists, young people of promise and older people of achievement, specialists and generalists.

Part of the staff would be permanent. These would include senior professionals, covering a range of disciplines or practical backgrounds, and junior professionals, providing many of the technical and analytical skills needed to fill out project teams.

Another portion of the project staff would comprise professionals from the other Directorates and other Federal agencies, who would bring their special expertise to the project teams and benefit from the opportunity to participate in an active study.

About half of the Center staff would comprise junior and senior fellows, selected on the basis of their accomplishments and potential for future achievement. These would be six-month to two-year appointments, intended to maintain a flux of staff from the R&D and education communities through the NIE. The NIE would benefit from the new ideas and competencies brought in by the fellows and from their first-hand knowledge of the realities of R&D and practice. The fellows would benefit from the stimulation of new surroundings and fellow workers and from the high-quality, though informal, education they would receive. They would return to their institutions or school systems better informed about the NIE's programs and the breadth of American education.

Some individuals who are qualified to be resident fellows might find it difficult to obtain a leave from their home institutions. In order to enable them to participate to the extent they can, the NIE would have associate fellows. They would be considered part of the NIE staff and brought to the Center for shorter periods during the year as their availability permits.

As the Center for Education Studies develops, it may be desirable to establish a greater degree of internal structuring and a more formal series of programs. However, those decisions would be better made after some experience has been accumulated.

ORGANIZATIONAL ALTERNATIVES

In developing an organizational structure for the NIE, a number of alternatives were considered and rejected. The three principal ones were:

Multiple Institutes, on the model of the NIH

Large intramural program, on the model of the National Bureau of Standards.

Regional Institutes

The advantages and disadvantages of each are described below.

Multiple Institutes.—Both Krathwohl's and the Commission on Instructional Technology's proposals, mentioned in Chapter I and summarized in Appendix A, call for the creation of National Institutes of Education with a central coordinating staff and a number of subinstitutes. The Commission recommended a National Institute of Instructional Technology. Krathwohl suggested the possibility of a National Institute of Urban Education and a National Institute of Education for the Handicapped. Both conceive of each Institute conducting and supporting extensive research, development, and application activities in its area of concern.

The principal advantages of such an arrangement are:

The possibility of organizing comprehensive programs of research, development, and application, employing a wide diversity of skills, addressing a major area over a long period of time;

The enhanced ability to develop powerful constituencies in support of R&D programs in a particular area; and

The program stability and focus that institutionalization would bring.

Against these, the following disadvantages must be balanced:

The reduction in staff and budget flexibility that would occur if each Institute were to operate semiautonomously on the NIH model;

The reduction in intercommunication and coordination (and the increased chances of overlap) that would be encouraged by the natural desire to develop complete programs in each Institute;

The difficulty of defining appropriate topics of interest for individual Institutes (Instructional Technology or Instructional Process, Urban Education or the Disadvantaged, Higher Education or Educational Finance);

The dispersion of intramural effort among several Institutes;

The possibility of instructionalizing problems that turn out to be transitory or closely linked to problems studied by other Institutes; and

The dispersion of staff and effort during NIE's early development.

As the NIE grows and understanding of appropriate management structures for educational R&D increases, it may become desirable and feasible to divide it into several Institutes. However, on balance, it seems advisable in the early years to retain the flexibility and compactness provided by a single Institute.

Large Intramural Program.—A second possibility for the NIE would be the establishment of a very large intramural program, spanning research, development, and application in most of the disciplines and subjects concerning education.

The advantages of this organization would be:

The creation of a "capstone" R&D performance organization of a breadth and diversity unmatched anywhere else and able, therefore, to undertake educational studies of a type and quality currently unattainable;

The enhanced attraction for top-quality individuals to join the NIE, both in the intramural program and as extramural program officers, that would come from the reputation and intellectual excitement provided by an excellent intramural R&D activity; and

The enhanced reputation of educational R&D that would derive from a highly visible, highly competent national research and development organization able to attract a diversity of talents and disciplines to studies of education.

The disadvantages would be:

The general shortage and maldistribution of experienced and competent R&D personnel and managers in education would be worsened in the short run by their attraction away from universities, educational laboratories, and educational agencies to the NIE;

The difficulty of recruiting for and managing a high-quality intramural R&D enterprise would divert NIE management attention away from the development of a strong extramural program and the development of strong R&D institutions elsewhere;

The danger of developing an R&D enterprise that is divorced from the realities of education and close association with actual school systems and learners; and

The possibility of developing a single dominant educational R&D organization.

Again, the balance appears to lie against the establishment of a *large* intramural program at the beginning of the NIE. The course chosen has been to start with a small intramural program, in the form of the Center for Education Studies, whose focus would be on activities not now being performed, of national or broad educational importance. As the NIE and the external educational R&D community grow, it might be appropriate to expand the NIE's intramural program. The recommended organization leaves that option open.

Geographically Distributed Institutes.—A third organization that has been considered during the planning is a series of Institutes distributed around the country.

The advantages of this structure would be:

Location of R&D facilities closer to the state and local educational agencies who face the problems and must use the products of the Institute's work;

The likelihood that alternative approaches would be explored at different Institutes, providing diversity and competitive cross-checks; and

Responsiveness to local and regional problems and development, and therefore, of strong local constituencies.

The disadvantages would be:

The shortage of management and R&D talent makes it difficult to staff several such Institutes;

May problems are national in scope and their study and resolution should be organized and supported nationally;

Regional distribution does not necessarily lead to close association with regional problems; and

The Institutes would compete with existing local and regional agencies (such as the Regional Educational Laboratories) which should be strengthened.

Again the balance of arguments appears to be in favor of a single National Institute at the beginning. A major part of that Institute's efforts should be devoted to strengthening regional institutions and their linkage with state and local agencies. Among the most important of those institutions are the Regional Educational Laboratories. As the NIE develops, these Laboratories might come to play the role of Regional Institutes.

V. Relations With the Educational System

If the NIE is to be successful in linking R&D with practice, it must pay careful attention to establishment of appropriate relationships with the numerous and diverse institutions and personnel who constitute the educational system.

The *institutions* include almost 18,000 school districts, 2,500 colleges and universities, thousands of private educational organizations, 50 state departments of education, over 800 teacher-training institutions, several hundred professional associations and unions, a half-dozen Federal agencies, several tens of independent R&D institutions, and a number of interstate consortia and compacts. The *personnel* include 60 million students, 3 million teachers, several hundred thousand administrators, and over 5,000 researchers and developers.

Obviously, the NIE itself cannot be in contact with more than a small sample of these institutions and individuals. However, it must develop mechanisms to identify the issues facing the various parts of the educational system and to transfer the products of R&D into practice. And it must encourage and facilitate the development of such mechanisms throughout the educational R&D system.

The form those relationships might take with each of the major constituents of the educational system is described in this chapter. After a discussion of general principles, relationships with the following groups are discussed:

Office of Education
Other Federal agencies
National Foundation on Higher Education
State agencies and interestate consortia
Local agencies
Private and nonformal education organizations

Regional Laboratories and R&D Centers
Schools of education
Colleges and universities
Scientific and professional societies

PRINCIPLES FOR RELATIONSHIPS

The philosophy that underlies the following detailed discussions may be summarized in a few statements:

The flow of information must be in both directions.—The question is not only the dissemination of R&D products to the field, it is just as importantly the determination of R&D needs from the field.

The flow of information must be continuous.—It is not sufficient to determine that a problem exists, undertake an R&D program, and then present its results to the prospective user. The interchange between R&D and practice must continue throughout the R&D activity.

The flow of information occurs most effectively through individual contact.—Although printed reports, journals of abstracts, and comparative evaluations are important, studies of innovation show clearly that the most effective form of information transfers is from person to person. In practice, this means that if R&D findings are to reach an educational agency and if that agency's problems are to benefit from R&D, there should be individuals with R&D interests in close association with the agency.

The flow of information must occur at all levels.—The occasional deliberations of high-level advisory groups are not sufficient to achieve close relationships between R&D and practice. Rather, there must be a constant flow of people and ideas between the systems at every level and at many points.

Practitioners will be more interested in and hospitable to R&D activities if they have some responsibility for them.—Two meanings of the term "responsibility" are intended here: The first is the responsibility that a chief state school officer, local superintendent, or college president would feel for R&D that his institution had commissioned on issues or problems of immediate concern to it. The second is the responsibility that a teacher would feel for a new curriculum that he helped to develop or adapt to his school system's needs. Experience in other fields has shown that such responsibility for R&D facilitates the adoption of its results.

No single mechanism or set of mechanisms for contact is sufficient; many ad hoc devices should be employed.—Advisory committees, reports, journals of abstracts, traveling exhibits, demonstration facilities, personnel exchanges, conferences, "county agents," and many other devices contribute to the proper exchange of information and attitudes. The NIE should not rely on any single, prescribed "dissemination" system; it should aspire to a rich network of relationships comprising many different kinds of linkage.

OFFICE OF EDUCATION

Many of the individuals and groups consulted during the planning study expressed concern about the relationship between the OE and the NIE. (The alternative forms that this relationship might take are discussed in Chapter IV, *Organization*. This discussion assumes that the OE is parallel to the NIE and has principal responsibility for educational assistance programs.) Some feared that the division of authority would make "bureaucratic" problems more severe; some envisioned an uncoordinated Federal educational policy; some felt that the OE would lose the benefits of R&D directed to its programs' problems. These are potential problems that must, indeed, be faced and resolved during the NIE's creation and early years of operation. The *objectives* should be to create a relationship that results in:

Consistent Federal educational policies.
Minimization of bureaucracy as seen by private, local, and state agencies.
NIE programs responsive to OE needs.
OE implementation of the results of NIE programs.

Among the *means* to achieve these objectives are:

The designation by the Secretary of HEW of one official to oversee both the OE and the NIE and be responsible for the coordination of their policies (this could be the Commissioner of Education).

The participation of OE officials as members of NIE advisory councils, groups, and boards.

The participation of OE staff members at the NIE Center for Education Studies and on the NIE task forces.

Establishment of a system of standing committees with joint membership from NIE and OE to develop coordinated R&D and assistance programs in major areas of concern, such as the disadvantaged, vocational education, higher education, and so on. One function of these committees might be to see that NIE's program activities and findings are linked to OE's large demonstration programs for tryout.

The assignment of NIE staff members on tours of duty in OE bureaus.

The provision in each OE bureau of a small mission-oriented research, development, planning, and evaluation staff.

The last suggestion is the only controversial one. It follows, however, from the belief that linkage will occur most naturally through individuals with R&D competency. The bureau-based staff would be expected to remain in close contact with the NIE staff, to be aware of NIE programs of relevance to their bureau, to encourage the initiation of modification of programs to serve the bureau's needs, and to adapt the results of R&D programs to the bureau's situation. They would also undertake or support studies and analyses directly relevant to the bureau's interests. They would not undertake large-scale or long-term programs of general educational relevance. The bureau's capability to undertake its own R&D activities will keep it from having to go to the NIE to satisfy every immediate requirement (with the mutual dissatisfaction that is bound to result) and will make it a much more interested and knowledgeable user of the NIE's services. The Secretary's designee should insure that the bureau programs do not exceed their proper scope and do not duplicate NIE activity.

OTHER FEDERAL AGENCIES

Education and educational R&D are the concern of several other Federal agencies. The most notable existing agencies are the NSF, the Office of Child Development of HEW, the OEO, the National Institute of Child Health and Human Development of NIH, the National Institute of Mental Health, the National Foundation on the Arts and the Humanities, the Department of Defense, and the Department of Labor. The NIE must establish linkages with these Federal agencies also.

The *objectives* of its relationships should be:

To insure that the national educational R&D effort avoids duplication, provides a coherent attack on major problems, and includes enough diversity to insure that promising alternatives will be explored and that no single point of view predominates.

To insure that the NIE's efforts respond to the needs of these Federal agencies and that its results reach them.

The *means* of achieving these objectives should include:

Maintenance and distribution by the NIE of information on all educational R&D activities sponsored or conducted by Federal agencies. (This would support the requirement that the National Advisory Council prepare an annual report on the status of educational R&D.)

Formation of an interagency committee on educational R&D chaired by the NIE to facilitate exchange of information and joint planning among the several agencies. This committee should identify areas of specialization for each of the agencies and seek to assure that duplication of effort is avoided.

Conduct of projects having joint interest under joint sponsorship of several Federal agencies.

Participation by staff from the Federal agencies in the program of the Center for Education Studies and on the problem-oriented task forces.

Evaluations by the NIE, especially the Center for Education Studies, of Federal educational programs that cut across agencies.

NATIONAL FOUNDATION ON HIGHER EDUCATION

The Administration has proposed creation of a National Foundation on Higher Education (NFHE) as a means of providing discretionary funding "to encourage excellence, innovation, and reform in higher education; to strengthen postsecondary educational institutions or courses of instruction that play a uniquely valuable role in American higher education or that are faced with special difficulties; and to provide an organization concerned with the development of national policy in higher education." As initially proposed, the Foundation

would be constructed on the model of the National Science Foundation—a semi-autonomous agency governed by a Board and a Director appointed by the President. If the NFHE is authorized by the Congress, a close relationship between it and the NIE will be important.

The *objectives* of the relationship should be to insure that:

Federal higher educational policies are consistent.

NIE programs are responsive to NFHE needs.

NFHE facilitates the introduction into practice of improvements and reforms developed under NIE sponsorship.

Among the *means* to achieve these objectives are:

Participation of NFHE officials as members of NIE advisory councils, groups, and boards.

Participation of NFHE staff members at the NIE Center for Education Studies and on the NIE task forces.

Establishment of joint committees from NIE and NFHE to develop coordinated R&D and implementation programs in higher and postsecondary education. (The NIE would fund the research, development, demonstration, and evaluation of an innovation; the NFHE would fund its introduction into practice on many campuses.)

Participation by NIE staff members on tours of duty in the NFHE.

Participation by NIE officials in NFHE advisory councils.

Like the OE, NSF, OEO, and DoD, the NFHE might also sponsor some educational R&D activities of direct and immediate relevance to its programs and concerns. However, the Foundation's principal emphasis would be on providing the discretionary support that enables educational improvements and reforms to enter practice. The Institute would help to develop innovations in higher education; the Foundation would help to implement them.

STATE AGENCIES AND INTERSTATE CONSORTIA

The practice of education is the responsibility of the state and local agencies. Most innovation and reform must occur through these agencies. Close and continuous relationships between these agencies and the NIE is essential.

The *objectives* of the relationships should be:

To insure that the national program of R&D activities responds to the needs of the states.

To insure that the results of educational R&D are made available to the states in a useful form.

To facilitate the active participation of state agencies in educational improvement and reform through R&D.

Among the *means* of achieving these objectives are:

Participation by chief state school officers and their staffs in the Advisory Council and other advisory groups and boards of the NIE.

Participation by chief state school officers and their staffs in the activities of the Center for Educational Studies. (The associate fellows program described in Chapter IV is intended for state and local officials who might not be able to spend an extended continuous period away from their jobs.)

Support by the NIE for strengthening the role of the state agencies in the demonstration and dissemination of educational innovations. (This might be done in conjunction with the OE.))

Support by the NIE for the development of R&D competencies in state agencies *and* for their support of R&D activities responsive to their needs in universities, R&D centers, Regional Laboratories, and independent agencies. (The NIE might work with OE to develop a partial grant program to state agencies for these purposes.)

Support by the NIE for training programs for R&D and analytical staffs in state agencies, both for those already in the agencies and to prepare new professionals for such positions.

Sponsorship by the NIE of activities intended to develop analytical tools (such as improved information systems) for state agencies.

A number of these activities in support of state agencies have been included in Program Area IV, *Strengthening the R&D System*, described in Chapter III.

In addition to the state educational agencies, there now exist a number of interstate consortia or commissions that include education among their concerns. These include the Education Commission of the States (which is conducting the *National Assessment of Educational Progress*), the Western Interstate Com-

mission on Higher Education, the Southern Regional Education Board, and the new England Board for Higher Education. The NIE should include these agencies in its activities through the use of mechanisms like those noted above.

LOCAL AGENCIES

The need to establish close relationships with representative local educational agencies and higher educational institutions is evident. *Much of what has been said about state agencies applies in this instance as well, with the appropriate substitution of terms.* Superintendents, school board members, principals, teachers, students, community representatives, and parents should be represented in the several councils of the NIE and, more generally, in the councils of the many R&D instrumentalities it supports.

In addition to the objectives and means described in the discussion of state agencies, the NIE should consider the following *means* of establishing relationships with the local agencies and their personnel:

Encouraging the formation of interdistrict consortia to sponsor or conduct R&D activities of mutual relevance to the districts. The NIE and OE might help fund and train staffs for such consortia. The consortia could contract with universities, Regional Laboratories, or other independent organizations for R&D assistance.

Encouraging the participation of principals and teachers in NIE-sponsored R&D projects and in the work of the NIE's Center for Education Studies and program task forces.

Facilitating the formation of local agencies, like the Teachers Centers in England, through which innovative practices could be disseminated. Especially important is the development of techniques whereby practicing teachers can be engaged in R&D activities, familiarized with the results of R&D and helped to translate them to meet their local needs.

Developing mechanisms whereby teachers and principals and other local officials can help in determining the problem areas and priorities for educational R&D.

This set of relationships is the most crucial and the most difficult for the NIE to establish. Considerable effort should go into establishing them, especially during the Institute's early years.

PRIVATE AND NONFORMAL EDUCATIONAL ORGANIZATIONS

Educational institutions outside of the conventional, formal structure are increasingly important parts of the educational system. They include such agencies as job corps centers, profit-making technical schools, Children's Television Workshop and other television agencies, textbook publishers, and educational technology companies. The NIE must be concerned with these nonconventional forms and formers of education as well.

Its *objectives* should be:

To be aware of the problems and needs of these portions of the educational system and to develop program activities that respond to them.

To make the results of its activities available to these agencies, as appropriate, and to those in government agencies who are concerned with regulation of this sector.

The principal *means* of doing this would be:

Participation by representatives of these agencies on appropriate NIE councils, groups, and boards.

Participation by staff members of these agencies in the activities of the Center for Education Studies.

Study by the NIE of these agencies, their needs, and their prospects.

REGIONAL LABORATORIES AND R&D CENTERS

One of the major deficiencies of the educational R&D system and, most particularly, of its linkage with the educational system, has been the lack of institutions in which interdisciplinary, developmental, and applied activities might be undertaken. An attempt was made to alleviate that problem with the creation of university-based R&D Centers and independent, nonprofit Regional Laboratories during the mid-sixties. These kinds of institutions, as well as other independent research organizations that have turned their attention to educational

problems, will be essential constituents in the R&D enterprise supported by the NIE and especially important links between it and the educational system.

In the beginning there were 20 Regional Laboratories and 8 R&D Centers. The number of laboratories has been reduced in two stages, to a total of 11 in FY 1972, as a result of budget limitations and apparent dissatisfaction with the performance of some laboratories. At the same time, funding uncertainties and management constraints have hampered the ability of even the effective laboratories to develop first-class staffs and to transfer programs into practice. The NIE will take over the principal funding of the laboratories and centers. When it does so, it should aim to create a more mutually satisfactory relationship between the sponsoring agencies and the university-based and independent research institutions.

The *objectives* of the relationship should be:

To insure that an adequate number of institutions exist in which interdisciplinary, developmental, and applied educational R&D activities can take place.

To insure that the R&D activities in those institutions respond to the needs of the educational system and that their findings and products reach practice.

To insure that, subject to the requirements that their performance be satisfactory, the institutions are provided with sufficient funds, information and authority to permit effective staff and program development to occur.

Among the *means* of achieving these objectives would be:

Creation of additional laboratories, centers, and other independent agencies as the needs for new ones are demonstrated. (It is unlikely that the existing complement is adequate to meet education's needs. Even as support is withdrawn from some institutions, support should be provided to groups to develop new institutions to satisfy still unmet needs.)

Institutional support should be a major portion of an institution's budget only in the first few years and only to catalyze its growth. After that period, the majority of an institution's budget should be program support, obtained in some form of competition with comparable institutions. The remainder of the budget should be institutional support funds provided as some portion of program funds to be used for supporting research, staff and program development.

Multiple sources of support for the laboratories and other applied research and developmental organizations should be encouraged. Having the organizations work for other Federal agencies, state agencies, and local agencies will enhance their ability to link R&D with practice, provide additional evaluations of their quality, and reduce their dependence on and sensitivity to the program choices of a single agency.

The thrust of these recommendations is to reduce the one-to-one mutual dependence that now exists between the laboratories and centers and NCERD. The NIE would see its role as a catalyst to the creation of the institutions necessary to an effective R&D system and as a supporter of R&D at those institutions once they have passed through a beginning stage. But its obligation to them would be finite in extent. Upon reaching maturity, each institution would be expected to seek program support from multiple sources in competition with other R&D institutions. Institutional support funds would be provided only as a proportion of program funds.

SCHOOLS OF EDUCATION

Educational improvement and reform depend on changes in teacher performance. Central to the achievement of such changes are the schools of education and teachers colleges, where many teachers are prepared. The NIE's relationship with teacher education must be close.

That relationship should be guided by three *objectives:*

To insure that the results of educational R&D are suitably reflected in teacher education.

To insure that the problems of teacher education itself are the subject of appropriate study and development.

To help strengthen the R&D capability at schools of education.

Among the *means* of achieving these objectives are:

Participation by personnel from teacher-education institutions and associations on NIE advisory councils, groups, and boards. (Of special relevance

in this instance would be the Center for Professional Development that has been described in Chapter IV.)

Participation by personnel from teacher-education institutions and associations in the activities of the Center for Education Studies. (An individual might spend a sabbatic year with a joint appointment at the Center for Professional Development, where he would help in the management of the extramural R&D program, and at the Center for Education Studies, where he would participate in intramural studies involving teacher-education questions.)

Development of a strong program of activities focusing on teacher education in the Center for Professional Development directly, and throughout the other NIE programs indirectly. (See especially Program Element II-4 in Chapter III and other activities mentioned throughout the program.)

Encouragement of the restructuring of schools of education so as to bring educational R&D, educational practice, and teacher education into closer conjunction.

COLLEGES AND UNIVERSITIES

Institutions of higher education play several roles in the NIE's field of interest. They are providers of education; they train the personnel who provide education; they perform educational R&D; they train the performers of educational R&D; and they are the subject and users of educational R&D. Almost everything the NIE undertakes must be in some relationship with colleges and universities.

Directing these relationships should be the following *objectives:*

To undertake R&D activities relevant to the needs of higher educational institutions.

To insure that the results of R&D activities are made available to the institutions for their own use, when appropriate, and for inclusion in their teacher-education programs.

To support and strengthen the education-relevant R&D capabilities of the colleges and universities, not only in the schools of education, but throughout the campus.

To support and strengthen the education-relevant R&D personnel training capabilities of the colleges and universities, not only in the schools of education, but throughout the campus.

Among the *means* to achieve these goals are:

Participation by students, faculty, and administrators from colleges and universities on NIE advisory councils, groups, and boards.

Participation by students, faculty, and administrators in the activities of the Center for Education Studies (that is, members of these groups would be eligible for appointment as junior or senior fellows).

Encouragement of the formation of agencies (such as the Western Interstate Commission on Higher Education R&D groups) to work on the R&D needs of higher education.

Provision of consistent, adequate support to competent university-based educational R&D activities.

SCIENTIFIC AND PROFESSIONAL SOCIETIES

There already exist a wide variety of organizations whose principal role is the establishment of communication among dispersed professionals with common interests. These are the professional and scientific societies in education and R&D. Among them are such groups as the National Education Association, the American Council on Education, the American Educational Research Association, the American Mathematical Association, the American Psychological Association, National Science Teachers Association, American Association of Colleges of Teacher Education, and the American Association of School Administrators. These organizations are exceptionally important and useful channels of communication to and from the various disciplines and interest groups in education and R&D. The NIE should strive to employ these channels both to convey the results of R&D and to find out about needs and opportunities.

The *objectives* of the NIE's relationships with these groups should be:

To strengthen their role as transmitters of information within the R&D community, within the education community, and between the two communities.

To strengthen their role as links between the NIE and its several constituencies.

To strengthen the role of the scientific societies in raising the quality of educational R&D.

The *means* of achieving these objectives include:

Participation by professional and scientific society representatives on NIE advisory councils, groups, and boards.

Sponsorship of society-organized journals, conferences, and critical reviews related to the NIE's interests.

Use of existing society journals, meetings, and related activities to convey R&D results and to determine R&D needs and opportunities.

Since society members will almost always have some other education or R&D association, the web of relationships between the NIE and the societies will be much more complex than this listing might suggest.

VI. INITIAL ACTIVITIES

The preceding chapters have described what the NIE might become. This chapter discusses how, if the Congress authorizes its formation, it might get there. At its inception the NIE will face four major issues:

What should its initial program be?
How can it acquire first-quality staff?
How large should its budget be?
How should the transfer of responsibilities from the current NCERD to NIE occur?

INITIAL PROGRAM

The most important initial decisions, save the choice of a Director, concern program. From among the wide range of possibilities, only a portion of which have been displayed in Chapter III (*Program*), there must be selected a reasonable number of priority areas on which the Institute can focus its initial efforts. These must satisfy the criteria of worth and balance identified earlier. Most especially, they must promise some early practical returns.

Not only the substance of the program but also the method by which it is developed and the individuals who are involved in its development are important. The Institute should quickly establish its concern for its constituencies and for quality. This means that a wide range of highly respected and knowledgeable individuals from R&D and practice should participate in planning the NIE's initial program.

An appropriate way to proceed would be to develop an *Agenda for Educational Research and Development.* A planning staff and advisory council, aided by panels of consultants, would examine each of the major areas of educational R&D. They would review prior and current work, identify what needs to be done, and define desirable programs of work in each area. The staff and advisory council would then merge the programs in each area into a coordinated program and recommend program priorities. Members of the consultant panels and the advisory council would be chosen from distinguished educators and scholars. This activity would take between six months and a year, but because of its general importance for educational R&D, it should be begun even before the NIE is authorized.

The results of this effort would also assist in the Institute's initial staffing (some panel members and staff, and those they recommend, might be asked to join the NIE), in budget planning (the panels would be asked for budget estimates for their program recommendations), and in the transfer of responsibilities from the NCERD (the panel reports could guide NCERD's program during the transition period to the NIE).

INITIAL STAFFING

The choice of a Director is the crucial staffing decision. His ability to attract other first-class individuals to fill major positions, his judgment in making program decisions, and his competence in describing program achievements and needs to the several constituencies will determine the Institute's success. And, of course, he must have the confidence of officials in the executive branch and in the Congress. These requirements seem to point to an individual of demonstrated competence in R&D and in administration. Implicit, as well, is the desirability of his appointment being made without the intrusion of partisan political considerations.

A successful NIE program will require the cooperation of a number of disparate communities: practicing educators; "traditional" educational researchers; natural, social, and behavioral scientists; humanists; artists; and technologists. A major responsibility of the Director will be to bring these groups together in new ways. For that reason it is essential that he be a highly competent and widely respected person whose stature and reputation are such as to raise him above factional differences among these groups.

The Director should choose his deputy and assistant directors and work with them on other major staff choices. It would be desirable to bring many of the initial staff on for two-year appointments. And, as noted above, should an agenda development activity be undertaken, its participants might become staff members or help in identification of prospective staff.

INITIAL BUDGET

A major part of the NIE's initial budget will be funds currently planned to be expended by NCERD. About $130 million* of the FY 1973 plan total would be transferred. The major question is, How much of an increment should be added? There are two viewpoints.

The first argues that the initial budget should contain a large increment because:

- The problems are large and the current effort is far too small;
- A small initial increment will make subsequent growth more difficult; and
- The size of the budget increment indicates the seriousness with which the Congress and the administration view the Institute.

The second maintains that slower, steady growth is the proper course for the NIE because:

- Personnel, managerial, and institutional resources are too limited to spend a large increment wisely;
- A large, poorly expended initial increment will make subsequent growth difficult (witness the difficulties with earlier R&D institution building); and
- It will prove sufficiently challenging to expend existing resources and a small increment wisely.

These opposing viewpoints demand the specific discipline of designing a detailed R&D program, including identification of its prospective performers, for appropriate resolution. This is another reason for encouraging an early development of an agenda for educational R&D, with budget figures.

Short of such a program, budget estimates must rely heavily on judgment. The judgment expressed at the NIE planning meetings might be summarized as follows: The first-year increment should be around $25 million. Five years after inception, the NIE's budget should be able effectively to employ at least a $250 million increment. (This total would still represent less than 1 percent of education's contribution to the GNP.) A tenth-year increment of $1 billion would begin to create an engine of improvement and reform large enough to move the education system. Table 9 summarizes those figures and some intermediate steps, assuming that the NIE begins full-scale operation in FY 1973.

TABLE 9.—BUDGETS FOR NIE

[In millions of dollars]

Budget	Fiscal year 1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Baseline budget	130	130	130	130	130	130	130	130	130	130
Budget increment	25	50	100	175	250	375	500	650	800	1,000
Total	155	180	230	305	380	505	630	780	930	1,130

*Based on preliminary planning figures, which might change during the budgetary process.

TRANSFER OF RESPONSIBILITIES

Most of the budget authorities that are currently the responsibility of the NCERD should be transferred to the NIE. The result would be, as noted above, the transfer of about $130 million from the FY 1973 planned budget. This does not mean that the programs currently being supported by NCERD need also be transferred.

The authorities transferred should include:

General research, covering a wide variety of solicited and unsolicited research activities, including the regionally sponsored research grants program;

Targeted research—five activities intended to develop coordinated R&D programs on early childhood, reading, vocational education, organization and administration, and higher education;

R&D Centers and Regional Educational Laboratories;

Experimental schools;

Research training;

Research on dissemination;

Construction of R&D facilities; and

Overseas research.

Evaluation and policy-oriented research applied to the programs of the OE should remain in the OE, as should the collection of educational statistics by the National Center for Educational Statistics (NCES).

Dissemination services provided by the National Center for Educational Communications (NCEC) will be important for both the OE and the NIE. Thus, the NCEC should remain in the OE but be responsible for serving both the NIE and the OE. The NIE, however, should undertake the program of research into the process of dissemination (and, more generally, the process of innovation and reform) that the NCEC has been sponsoring. And the NIE may want to request the development of additional services from the NCEC.

The transfer of funding authority from the NCERD to the NIE should occur all at once, in order to avoid the disruption within the NCERD and in the outside community that a prolonged transfer would incur. To permit this passing of responsibility to take place smoothly, it seems appropriate to plan on the timetable shown in Table 10 (if the NIE is authorized during calendar year 1971).

TABLE 10.—TRANSITION CALENDAR FROM NCERD TO NIE

Agency	Responsibility — Fiscal year 1972	Responsibility — Fiscal year 1973
NCERD	Manage current program; consult with NIE staff on new starts and future planning.	All programs transferred to NIE.
NIE	Hire staff and develop program and organizational plans; consult with NCERD on new starts and future planning.	Manage full program.

APPENDIX A—PREVIOUS PROPOSALS FOR NATIONAL INSTITUTE(S) OF EDUCATION

There have been several calls for the establishment of a distinct national agency devoted to the conduct and support of educational research and development. Because they respond to the same set of circumstances that led the Administration to propose creation of the NIE, the two most recent proposals—those by David Krathwohl and by the Commission on Instructional Technology—deserve careful examination.

THE KRATHWOHL PROPOSAL

In his Presidential Address before the Annual Convention of the American Educational Research Association in February 1969, Dean David Krathwohl called for the creation of National Institutes of Education, separate from the Office of Education, but reporting to the Assistant Secretary for Education.

"The National Institutes of Education would consist of a central coordinating staff which would, like NIH, work with a series of institutes, each focused on a critical education problem. Each institute staff would develop the best possible research, development, dissemination, and installation program to solve the edu-

cation problem for which it would be responsible. It would carry out the program largely by working with those in educational institutions, industries, and laboratories with appropriate capabilities. In-house research would be carried on only if there were clear advantages. Problems around which an institute would be constituted could be as broad as urban education, or as circumscribed as the program now carried on by the Bureau of the Handicapped." [1]

In that speech, in a subsequent editorial in *The Journal of Educational Research*, and in testimony before Congress, he enumerated the *advantages* of such a proposal.

First, "it could provide a kind of stability for planning and carrying out programs that is lacking in the USOE, which changes both top personnel and orientation with each new administration.

"Second, by combining on its governing board such persons as researchers, professional educators, superintendents, and state department of education personnel, it would have the advantage of providing the forum for mutual education and the basis for a sense of community that are now lacking.

"Third, there is greater likelihood that, as an off-the-executive-line agency which is one step removed from the pressures, it could resolve the priorities issue of which problems have a combination of high social need and appear amenable to a research attack."

Fourth, "it provides for a visible focusing of effort on a given problem." . . . "For instance, given a problem such as urban education, one could identify the sociologists, psychologists, economists, political scientists, as well as educational researchers, with interests and ideas bearing on the problem. There would be a ready and concerned clientele in the schools that would benefit from such a focused effort; they, in turn, would be interested in helping to set priorities and advise on development."

Fifth, "the Institutes, like NSF, would take responsibility for the nurture and growth of the manpower and physical resources necessary for research, development, dissemination, and installation, so that these could be developed and used in the wisest possible way for the improvement of education. This concern is at a very low level now in the USOE.

"Sixth, by removing these programs from the Office of Education, it would prevent the continually threatened break-up of the Bureau of Research.

"Seventh, it would, of course, make coordination with the programs of the Office of Education more difficult: But . . . concern with the problems of education is spread throughout government. It is possible that a less-proprietary attitude could be built into the new Institutes so that greater cooperation among the Federal agencies would be possible."

Krathwohl also considered some possible *disadvantages*.

First would be "the difficulty of coordinating the program across the Institutes for the good of education as a whole . . . Related to this is the concern that a 'party line' might develop in a focused program, such as the National Cancer Institute has been accused of. Only research with certain orientations then receive [sic] support. For this . . , the best answer lies in the choice of staff with broad vision and the appropriate choice and use of panels and committees to maintain appropriate perspective."

Second, there is the concern "that the establishment of such a set of Institutes would further divorce education from the social sciences on which much of its research program depends . . . Regardless of where educational research is located, it will now need to coordinate with the social science wing of NSF."

Third, there is the concern with "the threat of Federal control of education which the in-house research capacity of such a unit poses . . . However, there appear to be enough checks built into the government appropriation machinery that this is probably more a potential threat than a real one."

REPORT OF THE COMMISSION ON INSTRUCTIONAL TECHNOLOGY

In its report, presented in August 1969, the Commission on Instructional Technology made six recommendations. For the purposes of this study the first two recommendations and their associated justifications are of greatest interest.

[1] The quotes here and throughout this appendix are from Krathwohl's address; his testimony before the General Subcommittee on Education of the House Committee on Education and Labor in March 1970; and his editorial in *The Journal of Educational Research*, December 1969.

Recommendation No. 1 concerns the establishment of National Institutes of Education, and Recommendation No. 2 proposes the establishment of a constituent institute, a National Institute of Instructional Technology.[2]

Recommendation No. 1

"A new institution—the National Institutes of Education (NIE)—should be established by Congress within the Department of Health, Education and Welfare, reporting directly to the Assistant Secretary for Education.

"The National Institutes of Education should be broadly authorized to develop, support, and fund greatly strengthened programs in educational research, development, and application (R. D. & A.).

"The National Institutes of Education should comprise several constituent institutes, through which grants would be made to universities and other independent research institutions. The institutes would also conduct research themselves. The NIE should sponsor, among other things, several strong autonomous regional R. D. & A. centers, plus a small number of compresensive demonstration projects."

In expanding on this recommendation, the Commission noted, "The National Institutes of Education and its component institutes would undertake a limited amount of research, development, and application themselves. This proportion should be relatively small, however—perhaps 10 to 15 percent. The majority of the work should be executed through grants made by the institutes to selected institutions, both public and private.

"The National Institutes of Education should be headed by a director with outstanding qualifications appointed by the President and aided in policy making by a small strong top-level Advisory Board, composed of government and non-government representatives. Each constituent institute should also be headed by a highly qualified director. Together the Advisory Board and the directors would act as a council to coordinate the work of the NIE.

"The National Institutes of Education should also be expected to maintain close ties with relevant research and development being conducted in the many federal agencies outside the Department of Health, Education and Welfare that operate education programs; also with the American Educational Research Association and with practitioners in other relevant disciplines such as social scientists and engineers.

"The National Institutes of Education could use the research models in agriculture and health as guides. In its disposition of research funds, for instance, the NIE might well follow the lead of the National Institutes of Health in concentrating research in universities and other research-oriented institutions through grants. In other important matters, however, agricultural research and development might offer a more appropriate model; e.g., with respect to the close cooperation maintained with state and local agencies and the emphasis on development and application as well as basic research.

"The National Institutes of Education proposed in this report may well be involved in research projects running three to five years or more in length. Annual funding in the ordinary way would limit the effectiveness of such projects. The new organization, therefore, should explore with the Bureau of the Budget the possibility of obtaining authority to use 'no-year appropriations' for research programs, or forward funding arrangements (100 percent committed for the first year, two-thirds for the second year, and one-third for the third year) similar to those developed by a number of government agencies including the National Science Foundation, the Atomic Energy Commission, the Environmental Science Services Administration, the National Aeronautics and Space Administration, and the Department of Defense."

Recommendation No. 2

"A National Institute of Instructional Technology (NIIT) should be established as a constituent of the proposed National Institutes of Education. The purpose of the NIIT should be to improve American education at all levels through the use of instructional technology. The focus of the Institute's activities should be on research, development, and application in equipment, instructional materials, and systems, and also in training personnel.

[2] All quotes are from the Commission on Instructional Technology, *To Improve Learning*, 1970.

"The proposed National Institute of Instructional Technology should strengthen and promote the most promising of the Research and Development Centers and Regional Educational Laboratories (now operating under Title IV of the Elementary and Secondary Education Act of 1965) which are conducting programs involving instructional technology, and should establish such other regional centers as it deems necessary."

"Like its fellow institutes, the National Institute of Instructional Technology could be a new locus of talent, energy, expertise, and imagination for American education, providing leadership and initiative for efforts from many sources. It should bring together scholars from many disciplines and experts from the various media representing divergent viewpoints, including talented people who have hitherto dedicated themselves primarily to their own professional fields and organizations and to their own communities and institutions.

"The Commission cannot emphasize too strongly the importance of 'a diversity of approaches.' The National Institutes of Education and its constituent institutes should constantly foster *alternative* schemes, in much the same way as systems analysis encourages alternative solutions to an objective that has been established. The problems of education will not be solved by any one approach. The very diversity of human beings and cultural patterns demand diverse approaches. In the past, education has tended to overlook this diversity and has been inclined to proceed on the assumption that everyone should be able to learn in much the same way. We propose, therefore, a decentralized pattern for the programs sponsored and coordinated by the National Institute of Instructional Technology, and we envisage regional clusters of institutions—universities, school systems, state departments of education, production centers—working together on projects of common interest and of national significance.

"The Commission has concluded that only the federal government can undertake the major responsibility for the expenditures for basic and applied research, development, and application required in the years immediately ahead. Furthermore, we believe that the minimum initial financing required to carry out the recommendations of this report is approximately $565 million. Of this about $150 million would be required to launch the National Institutes of Education and the National Institute of Instructional Technology. The remaining $415 million would be required for the first full year of operation, including approximately $250 million for the research, development, and application activities of the institutes, $25 million for the center or 'library' of educational resources, $100 million for demonstration projects, and $40 million for the training of personnel. The aggregate amount suggested would equal no more than 1 percent of the projected total expenditures for American education in fiscal 1972.

"This proposed budget, it should be noted, includes the present research activities of the U.S. Office of Education; it is, however, an *addition* to other authorizations for education programs by government and private agencies."

Appendix B—Questions Asked During Planning Study

I. Objectives

1. Should the Institute be concerned with all levels and kinds of education? Which ones should receive special emphasis?

2. At what stage in the planning cycle of research, development, demonstration, and dissemination should the Institute's responsibility stop?

3. Should the Institute play a coordinative role for educational research and development sponsored by other Federal agencies?

4. Should the Institute respond directly to guidance provided by state and local education agencies? More generally, what clientele should it serve?

5. Should the Institute have special responsibility for the proper growth of the educational research and development community through, for example, training and institution-building activities?

6. Should the Institute focus its efforts principally on short-term responses to urgent problems of education or on longer-term knowledge-building to provide the base for more effective problem-solving later? More generally, what balance should be sought between these two goals?

7. Should the Institute's intramural research program attempt to satisfy certain special needs or should it be distinguished chiefly by size and quality?

II. Research and development program

One set of questions of great importance concerns the topics that the Institute should address and the methods for determining, reviewing, and evaluating those choices.

1. What should the Institute's major research themes be?
2. How should the Institute's effort be distributed among the various age levels, populations, and purposes of education?
3. How should the Institute's effort be divided between research and development?
4. How should the Institute's effort be divided between intramural and extramural research?
5. How should the Institute's effort be divided between short-range and long-range research?
6. How should the Institute's effort be divided among the problems faced by Federal, state, and local education agencies?
7. How should the Institute's effort be divided among the several education-relevant disciplines?

A second set of questions concerns the mechanisms by which the Institute establishes its initial priorities and continually reviews and revises them.

1. How should resource allocations and project choices be made? How should the resultant research or development activity be reviewed? What forms of outside assistance should be employed?
2. Do the answers to these questions differ for intramural and extramural research?

A third set of questions concerns activities that support and extend educational research and development.

1. To what extent should the Institute support the training of educational research and development personnel? Should it perform training activities itself? What means should it use to support training programs?
2. To what extent should the Institute engage in dissemination activities? Of what kinds? Performed by whom?
3. To what extent should the Institute support the establishment of research or problem-solving activities within other Federal, state, or local educational agencies?

III. Organization and Structure

1. What should the internal organization of the Institute be?
2. What mechanisms should be established to assure appropriate interaction between the Institute's program and the research community?
3. What conditions must be satisfied in order to attract to the Institute the very highest quality educational researchers, developers, and administrators? How should their performance be evaluated and rewarded? To what extent should the staff be short-term? To what extent permanent? How large should the research staff be? What disciplines should it include?

IV. Relations Between NIE and the Educational System

1. How should the NIE relate to the operating bureaus of the Office of Education and the other Federal departments and agencies that support education and education-related activities?
2. How should the NIE relate to the variety of state agencies—from departments of education to state university systems—that affect educational operations?
3. How should the NIE relate to the operating sector—local school districts, schools, universities, colleges—of the educational system?
4. How should the NIE relate to other supporters of educational research and development—other government organizations, foundations, the education-products industry, educational associations, education-school endowments?
5. How should the NIE relate to other producers of educational research and development—Regional Laboratories, Research and Development centers, the National Center for Educational Statistics, academic institutions, state and local research bureaus, education-products firms, and nonprofit research institutions?
6. How should the NIE relate to the variety of professional and educational associations?

V. Initial Activities

1. How rapidly should the Institute grow in dollars, personnel, programs?
2. What should its initial program comprise? How should the projects be chosen so as to assure an effective beginning for the Institute?

Appendix C—Individuals and Organizations Consulted During Preliminary Planning for the National Institute of Education

List of Persons Consulted[1]

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Bevan, William, Vice President and Provost, The Johns Hopkins University, Baltimore, Maryland.
Blake, Elias, Jr., President, Institute for Services to Education, Washington, D.C.
Boozer, Howard R., Director, Educational Development Administration, Radio Corporation of America, Camden, New Jersey.
Bower, Joseph, Harvard Business School, Cambridge, Massachusetts.
Brickell, Henry M., Institute for Educational Development, New York, New York.
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Turnbull, William W., President, Educational Testing Service, Princeton, New Jersey.
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Ward, Paul, American Historical Association, Washington, D.C.
Westheimer, Frank H., Department of Chemistry, Harvard University, Cambridge, Massachusetts.
White, Sheldon, Graduate School of Education, Harvard University, Cambridge, Massachusetts.
Whittier, C. Taylor, Commissioner of Education, Department of Education, Topeka, Kansas.
Wiesner, Jerome B., Provost, Massachusetts Institute of Technology, Cambridge, Massachusetts.
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Williamson, H., American Economic Association, Evanston, Illinois.
Wright, Stephen J., Vice President, College Entrance Examination Board, New York, New York.
Zacharias, Jerrold R., Director, Education Research Center, Massachusetts Institute of Technology, Cambridge, Massachusetts.

List of Formal Meetings Held on NIE Planning

1. *NIE Planning Conference*, July 6 & 7, 1970, Cambridge, Mass. (This meeting was organized by Prof. J. Zacharias and Dean T. Sizer and sponsored by the Sloan Foundation. NIE Planning Staff members were in attendance.)
2. *NIE Program Planning Conference*, August 3 & 4, 1970, Washington, D.C.
3. *NIE Organization Planning Conference*, August 17 & 18, 1970, Washington, D.C.
4. *NIE Planning Conference*, August 27 & 28, 1970, Stanford, California. (This meeting was organized by Prof. L. Cremin and Dean H. T. James and sponsored by the NIE Planning Study.)
5. *NIE Planning Conference*, September 2, 1970, Princeton, New Jersey. (This meeting was organized by Vice President R. Solomon of the Educational Testing Service and sponsored by ETS and the NIE Planning Study.)

Groups to Whom Presentations Were Made

Regional Educational Laboratories and Research and Development Centers Directors Meeting, June 5–8, at Denver.

Commissioner's Conference of Chief State School Officers, June 18, 1970.

Carnegie Commission on Higher Education, June 26, 1970.

President's Science Advisory Committee (Education Panel), July 2, 1970.

American Educational Research Association (Sponsored Meeting of Discipline Groups), July 29, 1970.

American Association of Colleges of Teacher Education, School for Executives, August 20, 1970.

Subcommittee of Chief State School Officers, August 21, 1970.

EDUCOM (Interuniversity Communications Council, Inc.), October 15, 1970.

Association of Schools and Colleges of Education in State Universities and Land-Grant Colleges, October 26, 1970.

Federal Government Agencies Consulted

Interviews have been held with officials in the following agencies:

- *White House*
- *Executive Office of the President*
  - Office of Science and Technology
  - Office of Management and Budget
- *Office of the Secretary, HEW*
  - Office of the Assistant Secretary for Planning and Evaluation
- *Office of Education*
  - All major bureaus; National Center for Educational Research and Development; Deputy Assistant Secretary for Planning, Research, and Evaluation; National Center for Educational Communication; National Center for Educational Statistics.
- *National Institutes of Health*
  - Office of the Director
  - National Institute of Dental Research
  - National Institute of Arthritis and Metabolic Diseases
- *Office of Economic Opportunity*
  - Office of the Assistant Director for Planning, Research, and Evaluation
- *National Science Foundation*
  - Office of Assistant Director for Education
  - Office of Assistant Director for Institutional Programs
- *National Bureau of Standards*

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APPENDIX E—NATURE OF EDUCATIONAL RESEARCH AND DEVELOPMENT

INTRODUCTION

The complex of activities that constitute educational R&D can be characterized in many ways. One commonly used characterization distinguishes four major classes of activity: *research, development, evaluation*, and *innovation*. Three of these classes—*research, development*, and *innovation*—correspond directly to analogous activities in physical science and engineering. The additional class of activities—*evaluation*—acquires importance in education because measurement is technically and philosophically more difficult and important in education than in the usual R&D processes. A listing of these classes and some of their subclasses appears in Table E–1.

RESEARCH

Research is the process of discovering explanations for observed phenomena through identification of the critical variables and the relationships between them. Research that is undertaken in order to answer a question arising from development work, or research whose results might immediately affect a decision

in development projects is often called *mission-oriented research*. Research that is not likely to affect development immediately or that is done primarily to add to the store of knowledge is often called *basic research*. Basic research results may alter perceptions and lay the foundation for major educational change, but in themselves they rarely affect current decisions.

EVALUATION

Evaluation is the process of measuring or assessing the degree to which an educational activity reaches its goals; it frequently includes the work of expressing those goals. Evaluation assumes prominence because measurement of effects, which is essential to success in an R&D activity, is much harder to accomplish in education than it is in the physical technologies. Evaluation includes not only measurement of cognitive achievement, but also identification of value changes and influences on the affective domain. Evaluation cannot often be delegated to electronic or mechanical devices in education. Sometimes it is best accomplished by visual observation and subjective analysis.

TABLE 5-1.—SUBCATEGORIES OF EDUCATIONAL R. & D. ACTIVITY

Category	Description	Examples
RESEARCH		
Basic research	Conducting basic scientific inquiry	Molecular, biochemical, and physiological bases of memory. Impact of environmental factors on "disadvantaged" children. Small-group theory.
Mission-oriented research.	Resolving a question arising in development or operation.	Factors affecting enrollment in adult education. Optimal sequencing of tasks in teaching language by computer.
EVALUATION		
Policy evaluation	Developing information to assist in decision-making.	Distribution of Federal financial aids to universities and students. Incentive structures in educational development markets.
Program evaluation	Comparing the performance of an educational program against intended objectives.	Analysis of ESEA title I programs. Comparison of reading curricula.
Outcome evaluation	Exploring the merit of an educational product or solution.	Judging the effects of a CAI program for Russian instruction. Measuring the performance of a new secondary school physics curriculum.
Assessment evaluation	Determining the status of participants in the educational system.	Longitudinal study of career patterns. Testing cognitive and emotional status of students.
DEVELOPMENT		
Operations development.	Inventing a solution to an operational problem.	Algorithm for flexible scheduling. Recommendations for classroom attendance policy. Guidelines for conflict resolution.
Product development	Engineering packages and programs for educational use.	Develop TV math course for preschoolers. Develop program for retraining teachers of new chemistry curriculum.
INNOVATION		
Dissemination	Informing users about solutions and programs.	Clearinghouse on teaching of foreign languages.
Demonstration	Displaying operating models of developed solutions and products.	Visit classroom where microteaching is underway.
Training	Re-educating practitioners in the use of developed solutions and programs.	Summer institutes for math teachers. Survey course in research techniques for administrators.
Servicing	Nurturing and supporting installed programs and products.	Inservice training for users of new anthropology curriculum. Adjustment of program to user needs.

Evaluation comprises a broad range of activities that are not sharply distinguishable. One possible categorization is into four classes: First, there is *policy evaluation*, which is analysis of strategic alternatives for decision-makers. Generally such work is done at the state and Federal levels of government. Then there is *program evaluation*, which is exploring and measuring the effect of an educational program or programs at the local, state, and national levels. Third, there is *outcome evaluation*, which is the testing and verification of new educational products and solutions. And last, there is *assessment evaluation*, which is measuring the cognitive and emotional status of students and instructors.

DEVELOPMENT

Development is the creative process of inventing new products, systems, or procedures. The developer must rely on intuition and imagination in designing his product but should proceed in a disciplined way by using his store of knowledge, testing his ideas for correctness, and encouraging the criticism of colleagues.

Development has two subcategories: *operations development* and *product development*. Operations development includes activities leading to solutions for managerial problems. Product development includes invention of products for instruction or other educational uses.

INNOVATION

The term *innovation* will be employed for lack of a better one. It stands for the complex of actions involved in interconnecting R&D and practice. The process of innovation is not unique to education, since the same exchange must occur in every activity that seeks improvement through R&D. However, innovation is a bigger problem in education, since both the producers and users of educational knowledge are widely distributed and poorly organized.

Categorization of the parts of the innovation process is more difficult, since constituent activities are less easily isolated than in the other R&D functions. One possible classication is *dissemination, demonstration, training*, and *servicing*. However, the image of one-way transmission presented by this list does not reflect all the essential features of successful innovative activity. Feeding back user needs and problems during the R&D process is very often required for successful utilization of the final product.

INTERRELATIONS BETWEEN CATEGORIES

The impression should not be left that R&D functions can be performed in isolation, or that activity proceeds in a linear order from research to development to innovation. Activity in each function may be stimulated and redirected by problems uncovered during performance of another function, or results in one may enable better performance in another.

A most important interrelationship is the sequential application of research, development, and evaluation phases during the development process. After designing a first try at their solution, a disciplined development team will subject that solution to a rigorous evaluation. Elimination of the deficiencies revealed by evaluation is then attempted through research and/or developmental activity. This process can proceed through many development/evaluation cycles until a successful product is achieved. Experience indicates that more than five years may be required to complete major developmental projects.

NEED FOR EXPERIMENTATION

Strategies for conducting education R&D are strongly influenced by the nature of the educational process. First, it is very difficult to isolate components of the education system for study in a laboratory. Second, the number of factors affecting performance is so great that samples of a few are not sufficient to draw conclusions about educational processes. As a consequence, large-scale experimentation in real-life settings must be an important part of educational R&D.

Appendix F.—Performers of Educational Research and Development

INTRODUCTION

Educational R&D is performed in a wide variety of institutional settings, with more than 90 percent of the total effort produced by nonprofit organizations. In addition to universities, the list of nonprofit performers includes research institutes, professional associations, education laboratories, and public school systems.

A list of the institutional settings in which educational R&D is performed appears in Table F-1, along with a few examples that illustrate the range of contributing agencies in each setting. A list for other R&D fields would show similar categories and examples, except for one major difference: the absence of the Federal government from the education list. In education there are no

Federal laboratories conducting R&D, as opposed to the situation in the health field, for example, where the intramural program on the Federal level is substantial.

COLLEGES AND UNIVERSITIES

Educational R&D is conducted in universities and colleges under many different organizational arrangements. The most prevalent involves an *individual professor* soliciting support from the university or an external source of a topic-by topic basis. Another is the *research bureau*, an ongoing team of managers and professionals who service a particular set of clients, and who are given long-term support by those clients. Some of these bureaus are very service-oriented, as they concentrate on data services, testing, and problem solving at the local level. A third organizational arrangement in universities is the *program project*—a temporary group of students and professors drawn together for the purposes of meeting particular contractual objectives. At the present time, curriculum development is being done in this setting. The aforementioned forms are not necessarily found in the schools of education, but may be found in other schools of the university or as independent institutes or centers.

Table F–1—Examples of performers of education research and development[1]

Universities and Colleges; some examples are:
- School of Education, University of Massachusetts
- MINIMAST Project, University of Minnesota
- Bureau of Applied Social Research, Columbia University
- Office for Institutional Research, Wayne State University

Research and Development Centers; some examples are:
- Research and Development Center in Teacher Education, Texas
- Education Policy Research Center, Stanford Research Institute
- Center for Research, Development and Training in Occupational Education, North Carolina State University

State Departments of Education; an example is:
- Department of Public Instruction, Arizona

Local Schools and School Systems; some examples are:
- School District of City of Lincoln, Nebraska
- San Mateo Union High School District, California
- Milwaukee Technical College, Wisconsin

Education Associations; some examples are:
- National Education Association
- American Council on Education
- American Education Research Association

Other Professional, Public, and Welfare Organizations; some examples are:
- National Planning Association, Washington, D.C.
- Association of Research Libraries, Washington, D.C.
- B'nai B'rith, New York
- Archdiocese of San Francisco, California

Educational Laboratories; an example is: Far West Laboratory for Educational Research and Development, Berkeley, California.

Nonprofit Research Institutes; some examples are:
- Educational Testing Service, Princeton, New Jersey
- American Institutes for Research, Palo Alto, California
- Educational Systems Research Institute, Pittsburgh, Pennsylvania
- Institute for Defense Analyses, Arlington, Virginia

Business and Industrial Organizations; some examples are:
- Westinghouse Learning Corporation, New York
- System Development Corporation, Santa Monica, California
- Harcourt, Brace and Jovanovich, New York

A fourth organizational form found in universities is the *institutional research office* in administrative units. These offices are engaged in local test and measurement programs and policy-oriented research on matters of importance to the sponsoring institution.

[1] Examples shown are drawn at random from *Current Project Information, July 1970*, an ERIC publication.

RESEARCH AND DEVELOPMENT CENTERS

A fifth form of organization at the universities is the *research and development center*, financed by the OE to overcome deficiencies in the educational R&D system. The primary role of these centers is to conduct interdisciplinary, programmatic R&D. There is more emphasis on research than on development in the R&D centers. Effort is made to focus research efforts for cumulative effects and to concentrate on problems that affect education generally.

EDUCATION LABORATORIES

The *education laboratories* are independent, nonprofit organizations, financed initially by the OE, but with some support from consortia of educational interests. In general, the laboratories are intended to develop solutions to education problems, and to serve as organizers of education development capability. Emphasis is placed on developing usable products and money is spent on diffusion activities. Some laboratories concentrate on solving regional education problems.

STATE DEPARTMENTS OF EDUCATION AND LOCAL SCHOOL SYSTEMS

As a complement to provision of educational services, some local and state administrative units collect data, administer test programs, produce films and curriculum revisions, evaluate state and local programs, and prepare plans for allocating resources. The R&D effort is almost always directed to an immediate operating problem.

EDUCATION AND OTHER PROFESSIONAL, PUBLIC, AND WELFARE ASSOCIATIONS

Many professional and other associations conduct educational R&D. These associations collect, publish, and analyze data; evaluate educational policies and programs; and hold training sessions for researchers. The range of participating organizations is very broad, as the examples in Table F–1 illustrate.

NONPROFIT RESEARCH INSTITUTES

In addition to the nonprofit agencies already listed, another category of such agencies is involved in educational R&D: nonprofit corporations and research institutes. Some, such as the Educational Testing Service, sponsor in-house research; but contract research for a wide assortment of clients predominates.

BUSINESS AND INDUSTRIAL ORGANIZATIONS

In the profit-making sector, R&D activity is concentrated in the textbook and curriculum publishing business. As few numbers are quoted in public documents, the scale of activity in this sector is imprecisely known, but it probably accounts for only a small fraction of the total national R&D activity. Consulting firms and system analysis firms are in this category of organization.

APPENDIX G—A COMPARISON OF RESEARCH AND DEVELOPMENT IN AGRICULTURE, EDUCATION, AND HEALTH

This appendix summarizes an analysis comparing the effort devoted to R&D in education with that devoted to R&D in health and agriculture. It shows that in terms of both absolute level of R&D effort and R&D effort as a percentage of sector contribution to GNP, education is considerably less well supported than health or agriculture. The analysis itself will be published in a forthcoming report.

The comparatively low level of educational R&D may be seen by examining four different pictures for each sector for FY 1968:

1. The *man-years* of research, development, and innovation activity *performed* in each of the possible institutional settings;
2. The *dollars* of R&D expenditure in each of the institutional settings;
3. The *dollars* of research, development, and innovation *sponsored* by each of the institutional sources; and
4. The contribution to GNP in each sector.

Some of these pictures are also drawn for FY 1965 to show the impact that the Elementary and Secondary Education Act of 1965 has had on educational R&D.

Specifically, it can be concluded that in FY 1968 (see Table G–1):

1. The contribution to GNP was roughly the same in each field;
2. No more than one-fourth as many dollars were spent on *research* in education as in health or agriculture; and
3. No more than one-fifth as many dollars were spent on *development* in education as in health or agriculture.

As Table G–2 shows, the ratio of development to research sponsorship is higher in education (0.88) than in health (0.66), but lower than in agriculture and the economy as a whole (1.74). The emphasis on development in education is a recent phenomenon, however, since before the passage of the Elementary and Secondary Education Act in 1965, the ratio of development to research expenditures was much lower (0.31). The comparison of R&D funds by a sponsoring institution (see Table G–3) shows that education is very different from other R&D activities in that the Federal government supplies 88 percent of the education R&D funds. In the health field, government supplies 67 percent of the R&D funds; and in agriculture, 42 percent. At the national level, 57 percent of the R&D funds for all sectors are supplied by government.

A comparison of R&D communities by performing institutions produces equally striking differences. Education is unlike health, agriculture, and the economy as a whole in that neither the Federal government nor industry performs much of the R&D in the sector (see Table G–4). In all other sectors, at least 13 percent of the R&D dollars are consumed by the Federal government, and at least 29 percent by industry. Another difference is that in education, 57 percent of the R&D dollars are spent at colleges and universities, while in health the figure is 37 percent, and in agriculture, 22 percent.

TABLE G-1.—RESEARCH AND DEVELOPMENT ACTIVITY IN AGRICULTURE, EDUCATION, AND HEALTH

Sector	Sector national product (billions)	Fiscal year 1965 sponsorship [1] (millions)			Fiscal year 1968 sponsorship [1] (millions)		
		R	D	I	R	D	I
Agriculture	$73.5	$355	$385	$200	$379	$413	$241
Education	53.0	70	30	50	90	79	65
Health	51.5	1,086	724	(2)	1,446	949	(2)

[1] R=research; D=development; I=innovation.
[2] No activity explicitly devoted to innovation was identified.

TABLE G-2.—RATIO OF DEVELOPMENT SPONSORSHIP TO RESEARCH SPONSORSHIP, FISCAL YEAR 1968

Sector	Sponsorship (millions)		Ratio of development to research
	Research	Development	
Education	$90	$79	0.88
Health	1,446	949	.66
Agriculture	379	413	1.09
All sectors	10,000	17,400	1.74

TABLE G-3.—SOURCE OF RESEARCH AND DEVELOPMENT FUNDS, FISCAL YEAR 1968

Sector	Federal Government	Sate and local	All other	Federal percent of total	Government percent of total [1]
Education	150	3	17	88	90
Health	1,526	69	801	64	67
Agriculture	209	109	460	26	42
All sectors	15,000	500	11,900	55	57

[1] Federal, State, and local governments.

TABLE G-4.—EXPENDITURE OF RESEARCH AND DEVELOPMENT FUNDS, BY PERFORMER, FISCAL YEAR 1968

[In millions of dollars]

Sector	Universities and colleges		Federal Government		Industry		All other		Total
	Expenditure	Percent of total	Expenditure	Percent of total	Expenditure	Percent of total	Expenditure	Percent of total	
Education [1]	113	60	2	1	8	4	65	35	188
Health	875	37	362	15	695	29	464	19	2,396
Agriculture	174	22	156	20	460	58			792
All sectors	3,400	12	3,600	13	19,250	70	1,100	4	27,350

[1] Includes some innovation expenditures ($17,000,000), mostly by universities and colleges.

Table G-5 shows the amount of research, development, and innovation performed by institutions in FY 1968, in man-years of effort. Note that while 15,000 man-years of effort were devoted to specific innovation activities in agriculture, only 1,296 man-years were applied in education. No separately identifiable innovation effort was found in health.

TABLE G-5.—RESEARCH, DEVELOPMENT, AND INNOVATION EFFORTS, FISCAL YEAR 1968

[Man-years]

Activity	Federal laboratory	Colleges and universities	State and local agencies	Nonprofit institutions	Private firms	Other	Total
Agriculture:							
Research	2,090	2,360		(1)	7,950		12,400
Development	2,230	3,040		(1)	7,950		13,220
Innovation	15,000	0					15,000
Total	19,320	5,400			15,900		40,620
Education:							
Research		1,202	465	201	39	26	1,933
Development		906	566	801	77	257	2,607
Innovation		788	265	125	29	89	1,296
Total		2,896	1,296	1,127	145	372	5,836
Health: Research and development	10,350	24,900	(2)	9,230	10,690	4,211	58,570

[1] Some activity occurred, but the amount is negligible compared with other entries in agriculture.
[2] Included in entries of other performers.

CHICAGO PUBLIC HIGH SCHOOL FOR METROPOLITAN STUDIES—RATIONALE AND PROGRAM

Chicago Board of Education, Chicago, Ill.

II. INTRODUCTION

The Chicago Public High School for Metropolitan Studies will develop and implement a new approach to urban education. This new high school will be a school without walls whose activities will take place wherever there is learning to be done in the Loop area and the rest of the city. Its classrooms will be the city's businesses, hospitals, art museums, theater companies, neighborhoods, and other resources.

In utilizing these rich contexts for learning, the primary goal of the Chicago High School will be to develop and test educational ideas and programs to implement the "Recommendations for Modification of Secondary Education in Chicago," as stated in the Board's long-range plan, *Design for the Future* (p. D-33). These recommendations include:

A. Creating a magnet secondary school which will encourage greater curriculum innovation, experimentation, and evaluation.

B. Providing for greater participation and greater commitment of government, business, labor, and industry in the business of education.

C. Providing more varied educational options for students and parents.

D. Reducing the rigid classifications of students into vocational and academic groupings.

The initial year of the school's operation (1969-1970) will be devoted to planning and pilot operation involving 150 ninth, tenth, and eleventh graders drawn from all sections of the city and representing the academic, racial, and economic diversity of the city's high school youth.

The planning-pilot year will be carried out within the structure defined by the general goals, approaches to learning, and methods of organization and operation outlined in this description of the school. The essential purpose of this planning-pilot year will be to develop these plans for the school further and to test them in the light of actual school operation. Some will certainly be changed in basic ways as a result of the year's experiences.

III. THE SCHOOL'S EDUCATIONAL PROGRAM

The Chicago High School will implement some generally accepted goals of American education through several fundamental changes in educational practice. Among the goals on which the school will place particular emphasis are the following:

A. The mastery of those skills needed to function competently in our rapidly changing society.

B. The growth of self-esteem and independence of thought and action based upon the development of the student's aptitudes and interests.

C. The capacity to relate interpersonally with people from diverse backgrounds and with differing perspectives and to respect individual and group differences.

D. An understanding of societal processes and pressing social problems.

These goals are among those usually accepted by public high schools in the United States. Their wide acceptance, however, has not resulted in their widespread implementation. In many instances, the realities of educational practice have been at variance with the achievement of such goals. In working to clarify and to meet these goals, the Chicago High School will implement five broad changes in educational practice:

A. An expansion of the range of situations in which learning takes place so that the diverse resources of the Chicago community become the center of the student's education.

B. A broadly conceived curriculum that transcends disciplinary studies and is built in many respects on the student's urban experience.

C. Increased student control over his educational goals and activities.

D. Use of the diverse backgrounds of the student body as an educational resource.

Each of these changes in educational practice is described in more detail in the following sections.

A. School without walls

A student at the Chicago High School may begin his day working in an on-the-job training experience in an industrial laboratory learning physical chemistry research techniques. While he is working, he might spend part of his time interviewing fellow workers about their jobs or making journal notes concerning interesting people with whom he is coming in contact. He might spend the rest of his morning building sets for a theater company or practicing with members of an orchestra.

At lunch, he would meet fifteen fellow students for a counseling session in which they assessed the relevance of the school experience in terms of their personal interests and goals. The afternoon might begin with an English class in which other students who had been collecting character sketches of people on-the-job meet to compare and refine their sketches for a journal of student writing. He might then return to his neighborhood with a group of fellow students who are interviewing residents concerning their attitudes toward urban renewal. This survey, along with interviews of fellow workers collected earlier in the day, are part of his preparation for the next day's social studies class where students are attempting to gain a comprehensive picture of the attitudes of people from different parts of the city.

Such a school without walls multiplies the educational options available to the student and thus provides a much greater opportunity for the development of individual aptitudes and interests. It enables the students to participate in educational activities that are related to their personal and vocational goals, thus increasing the likelihood that they will learn and apply basic skills that may not seem relevant when taught in the isolation of the classroom.

The school without walls can also provide a meaningful setting for developing an understanding of individual and group similarities and differences. Students will learn to approach the community and its members as resources for learning. They will see that occupational and personality differences among individuals, as well as cultural differences among groups, provide complex perspectives for the problems they are studying. Further, by approaching people where they work or live, students are much more likely to gain accurate knowledge and develop well-informed attitudes about social problems and processes.

B. Curriculum innovation

The Chicago High School will continuously develop enriched educational programs. Presented below are (1) some starting assumptions about the nature of the school's curriculum and (2) a framework in which to proceed in its development through the planning-pilot year.

1. *Some Initial Assumptions About Curriculum.*—The curriculum will be divided into three broad areas: (a) skills, (b) humanities, and social sciences, (c) and natural sciences. The skill area will include those skills that are necessary to function effectively in our rapidly changing society. Some of these skills will be prerequisite to work on a specific project or in a specific curricular area, and others will develop naturally as part of an educational activity of a particular type. Some skills will be taught as separate courses (e.g. typing). Most, however, can best be taught if they are closely integrated into the other two major curricular areas.

In the humanities-social sciences area, topics traditionally found in such courses as English, history, foreign languages, art and music, as well as psychology, sociology, anthropology, and economics will be included. Some work will focus on topics that coincide fairly closely with these traditional subject matter areas. Much of the work, however, will deal with problems of the individual and of society, approached through the alternative ways of looking at man included in this division of the curriculum.

In the area of natural sciences, the studies usually classified as physics, chemistry, biology, mathematics, and logic will be included. Again, some work will explore subject matter and develop skills ordinarily covered in these courses. Emphasis will also be placed, however, on problems that involve several subject matter areas and involve sets of skills, procedures, and assumptions that underlie all scientific investigation.

It is easy to see how study in each one of these areas can be enriched by cooperation between well-prepared professional teachers and the organizations participating in the Chicago High School. For example, many skills for which the student sees no purpose when they are taught in isolation will be learned readily when they are needed to perform effectively on a job or to conduct and report on study of a neighborhood in which the student is interested. Also, many businesses have developed educational programs for teaching some specific skills, and the Chicago High School will take advantage of this expertise.

In the area of humanities and social studies, the experience of the students in the city will provide many rich resources. For students interested in drama, art, and music, direct contact with talented actors, musicians, and artists will become a daily reality. Job experiences and neighborhood study will provide a varied source of material for writing, photography, and other means of personal expression and communication. The diverse experiences of students working in various sections of the city will be employed as a basis for analysis of the city's social structure and problems.

In the natural sciences area, students will be exposed to talented mathematicians, engineers, scientists, and technicians engaged in the scientific enterprise. They will have available to them many facilities (computers and specialized research equipment, for example) that cannot presently be made available to the public school student. Further, the urban community, with many of its crucial problems requiring technological solutions, provides a setting in which the immediate relevance of scientific techniques and the interrelationships of various areas of scientific endeavor can be made apparent to the student.

2. *An Initial Framework for Developing and Testing the Curriculum.*—As the previous section indicates, the Chicago High School represents an opportunity to develop an exciting and valuable curriculum for Chicago's high school youth. At the same time, it requires the cooperation of many different individuals and organizations who have not previously worked closely together in connection with secondary education. An initial framework must be developed for the curriculum that will allow for its continued growth and modification and yet provide sufficient structure to make this new cooperation possible. One key aspect of this structure is represented by the division of a student's program into three interrelated types of activities:

a. "Units" of learning experience taught by participating organizations, by the school's certified personnel, and by these teachers and participating organization in cooperation.

b. "Courses" taught by the certified teaching staff of the school.

c. "Counseling groups" led by the certified teaching staff of the school and supervised by a certified counselor.

The "unit" experiences will be conducted in the businesses, cultural and government institutions, and neighborhoods of the city. In some cases, they will be offered by participating organizations. In others they will be planned jointly between the participating organizations and members of the school staff. In still others a member of the school staff will teach the unit, using meeting space and other facilities provided by the institutions. A fundamental notion on which the Chicago High School is based is that those directly involved in these various institutions in an excellent position to identify and develop many of these unit learning experiences.

The unit offerings might include learning activities like the following:

a. On-the-job training coupled with opportunities for the student to understand the relation of his work to the rest of the company.

b. Classes in art, music, and dance in cooperation with cultural institutions.

c. Research assistantships in the scientific investigations being conducted by various businesses, hospitals, and universities.

d. Journalism courses closely connected with the production of a newspaper.

e. Community attitude surveys in cooperation with news media, city government, and community organizations.

f. An examination of the ideas of creative work of a particular individual.

g. An examination of the research findings in a specific area of psychology or sociology.

h. Tutoring of children at an elementary school having trouble learning to read.

The unit does not have to be an elaborate undertaking covering a wide range of study. It will probably be most effective if it is closely related to the interests of the institution or individual leader offering it.

"Courses" at the school will be taught by certified faculty members and will fulfill the course requirements established for high school graduation and accreditation by the Chicago Public Schools, the North Central Association of Colleges and Secondary Schools, and the School Code of Illinois. Their specific content, however, will reflect both the *inter-disciplinary approach to curriculum outlined on pages four and five and the nature of the specific units of learning experience of the students in a particular course.*

Each course will attempt to relate the unit experiences of the student to each other and to those of other students. The course will provide a perspective on the unit experiences of participating students and will put these unit activities into broader contexts by introducing additional skills, ideas, and issues. For example, a major focus of the English course might be on refining character sketches collected by students in different unit activities for inclusion in a journal of student writing. Or a group of students involved in the production of a play with a local acting company might read and discuss other plays, both contemporary and classical, that contrasted sharply in style from the one being produced.

Similarly, in a social studies class students might use interviews gathered on the job and in their neighborhood to develop and test theories about the attitudes of people from different sections of the city. Or a science class might use the unit research of several participants as the basis for examining common methods of operation in scientific investigation.

The initial organization of the curriculum into units, courses, and counseling group. The major purpose of this group, which will meet once a week and will

be led by a teacher, is to provide an opportunity for students and teachers to assess the school experience in terms of their own interests and aspirations. The counseling groups will plan activities that will enable them to get to know one another better and to discuss the issues raised by their experience more fruitfully. These group counseling activities will be under the overall direction of a certified counselor.

C. INCREASED STUDENT PARTICIPATION IN LEARNING

Another important aim of the school's program is to provide students with a significant role in determining their educational goals and activities. Many educational experiments have failed in trying to increase student's choices. Initiating the process of student choice with students who have had little experience in making such choices will require sensitive strategies of transition.

The initial organization of the curriculum into units, courses, and counseling groups is an attempt to provide a realistic basis for the transition to increased student autonomy. The student will be allowed to choose those units he wishes to take within certain distributional requirements. A student will have the further option of choosing units of independent study to be taken in consultation with a member of the faculty. In his required courses, he will also shape his own program in significant ways, since the nature of the required course will reflect the units in the student's program. Finally, the counseling groups will provide a regular opportunity for assessment of the program in the light of the student's developing interests and aspirations.

D. STUDENT DIVERSITY AS AN EDUCATIONAL RESOURCE

The diversity of people and groups in Chicago provides a unique resource for an educational program. Integration across traditional group lines should be viewed not as a legal necessity but as a workable strategy to improve the quality of schooling for all students. Some of the most important learning that takes place in a school is a direct result of a student's contact with other people, both peers and adults. The greater the diversity represented by the people with whom the student comes into contact, the richer the potential learning experience for him. The Chicago High School student body will mirror the diversity of the city's youth in terms of ethnic background, social status, and academic ability.

Contemporary research in social psychology suggests that interpersonal and intergroup respect is developed most effectively when people with diverse skills work together in achieving a common goal. Several of the approaches to education proposed here reflect an attempt to create an educational environment in which students can capitalize on their diverse backgrounds, skills, and knowledge.

IV. IMPLEMENTATION OF THE EDUCATIONAL DESIGN

This section discusses four key aspects of the school that are essential to its development and which will receive high priority during the initial phase of implementation.

A. Student body

The student body of 150 students will be composed of 110 freshmen and 40 sophomores and juniors. These students will reflect the ethnic, social, geographic, and academic diversity of all Chicago high school students. It will include a number of sutdents who have dropped out of school and wish to return. Freshmen will be selected from volunteers in a manner to insure diversity. Upper-classmen will be selected in accordance with the above criteria, but in addition will possess leadership characteristics which will create a constructive climate in the student body.

B. Selection and nature of the staff

The core staff of the school will include a certified principal-teacher, a certified counselor-teacher, four certified Chicago public secondary teachers, one secretary, and a clerk-typist. The core staff will have been certified by the Board of Education and will be nominated by a committee composed of representatives of the Board of Education and of Urban Research Corporation. This core staff will be augmented by interns from local universities and the Teacher Corps, paraprofessionals drawn from the community, and specialists from various fields relevant to the school's educational program.

The success of the educational program outlined in the preceding section depends upon the staff that implements it. We must attract an imaginative faculty that is committed to helping test and develop the school's educational program and that is able to cope with the inevitable stresses that accompany any new educational venture. The nature of the educational program demands that the teacher perform a number of duties unlike those of classroom teacher. He must be willing to work closely with the diverse students who will attend the school and with the diverse personnel of participating institutions. He will encounter many learning situations in which his co-workers and his students are more knowledgeable than he is about certain aspects of the situation. The teacher must also act as counselor for a group of students, interacting with them in a manner somewhat different from the school's other educational situations.

These changes in the teacher's role are deliberate and reflect an attempt to develop new teaching-learning relationships. The school needs teachers who will accept this challenge.

C. INVOLVEMENT OF BUSINESS AND OTHER COMMUNITY ORGANIZATIONS

The Chicago High School will crystalize a partnership in education between the school, the business community, and other community organizations.

Specifically, public and private institutions may be associated with the Chicago Public High School in one or more of the following ways:

1. An institution may provide facilities, supplies, or services to the school.
2. An institution may donate funds for the support of the Chicago Public High School.
3. An institution may participate in the educational program of the school.

While all of these kinds of support are important, it is the third category—participation in the educational program—that is essential to the success of the Chicago Public High School. The development of curriculum units (see pp. 5–6) depends upon the creative commitment of business, cultural, and municipal institutions to both the planning and the implementation of the Chicago Public High School.

The stimulation of business contribution to the Chicago Public High School will provide the school with a level of financial support comparable to that available to many suburban school districts. By providing adequate financial resources for the school, the business community will make possible the development of a new educational approach that will be crucial in shaping Chicago's educational program in the future. The school will illustrate the school system's potential for innovation given sufficient resources.

D. A TIMETABLE FOR THE FIRST YEAR: THE PLANNING-PILOT-EVALUATION CYCLE

During the year 1969–1970, the school will go through two planning-pilot-evaluation cycles. During the first three weeks in January, students will participate in developing the final plans for the first period of pilot operation. For example, after students have examined the first "unit" offerings of the school, they will be asked to suggest additional units they might be interested in taking. They will then play a role in obtaining the necessary additional commitments from community institutions. This will also be a period when the student, through his individual counseling group, will discuss the units of study offered and make choices among them.

The period from the end of January through early April will involve pilot operation of the school program as it has been developed up to that point. During the latter part of April, the central focus of the school community will be on the evaluation of this pilot operation. Changes in the program will be made as a result of this evaluation process, which will form the basis for the remainder of the second semester. The second pilot period will run until early June and will be followed by a final evaluation of the program that will focus on further changes that should be implemented for expanded operation in 1970–71.

V. EVALUATION

The improvement of education can occur most effectively in an atmosphere where ideas are constantly tested in actual practice and accepted, rejected, or revised on the basis of careful evaluation. An effective evaluation program must involve both the teachers and students of the school in a careful consideration of their own successes and failures. Thus, the core of the evaluation process will

take place in day-to-day discussions of the school's activities among members of the school community. To supplement this process staff members will be asked to write periodic position papers on their educational goals and approaches, to keep journals recording their class activities, and to participate in periodic discussion of the relationship between their stated goals and what they see happening to their students.

Student papers will be collected, students and faculty interviewed, discussions leading to important decisions in the school tape recorded, and conventional tests of attitudes, motivation, and achievement administered. Faculty members and students will participate as researchers in these investigations to help insure that the research program is relevant to the large and small decisions that faculty and students must make within the school. For example, information will be collected not only to judge the school's success in reaching its larger goals, but also to help answer more specific questions (for example, assessing student interest in producing a play or teachers' opinions on the support given by the administration in scheduling out-of-school activities).

The evaluative process that is developed will initially be aimed primarily at providing those involved in the school's implementation with continuous feedback of information designed to help them in the process of developing goals and educational strategies for the Chicago High School and for assessing the extent to which they are reaching these goals.

The evaluation process will also provide a basis for assessing the progress of the school for those not directly involved in its operation. The Urban Research Corporation will make regular reports on the progress of the school to the General Superintendent and in the spring of 1970 will prepare a full and formal report, including recommendations, to the general superintendent.

VI. THE URBAN RESEARCH CORPORATION

The Urban Research Corporation is a new type of organization, created in response of the crisis confronting our nation's urban areas and predicated on a belief that the private sector must apply its expertise if major urban problems are to be resolved. The best selection from many ideas for constructive changes occurs when these ideas are subjected to the stringent measures of the marketplace.

The corporation is a research, development, publishing, and consulting firm, involved primarily in the area of urban affairs. Major emphasis is laid on activities related to public education.

Principal efforts of the Corporation to date have been a major study dealing with providing employment for chronically jobless persons and a weekly information service reporting and analyzing developments in urban economics, housing, politics, and education. In both of these projects, the Corporation has worked closely with representatives of business, government agencies, and the community.

The Educational Division of Urban Research Corporation offers its services to schools, community groups, and other institutions engaged in education who wish to:

Develop new educational programs or change existing ones.

Facilitate meaningful participation of parents, students, and community representatives in school planning and operation.

Establish or improve staff development programs for administrators, teachers, and community residents working in the schools.

Evaluate on-going or new programs.

Improve interpersonal relationships in their systems.

We differ from other private organizations in education in that we are primarily neither a consulting firm nor a producer of materials. Instead, we seek to develop a new kind of relationship with communities and educational agencies based upon direct involvement as a partner in the planning, operation, and evaluation programs. One of our primary objectives is to bring into active and productive collaboration people not ordinarily involved in educational planning, including students, parents, businesses, cultural institutions, and community representatives.

The members of the Educational Planning Division Staff bring to this enterprise extensive backgrounds as teachers, administrators, curriculum specialists, researchers, and community organizers.

EVALUATION

1. Potential of the Metro evaluation

Innovative school programs have seldom been evaluated carefully to determine how they differ from conventional school programs and what effects these differences have on their students as compared with students in conventional schools. Further, evaluation has almost never become an integral part of a school's operation and planning, such that it constantly feeds information back into the school program to facilitate its continual improvement.

The evaluation of Metro, if carried out along the lines described in this report, has the potential to become a nationally-recognized example of successful program evaluation. In addition, such careful evaluation will be crucial if the Metro program is to improve as it expands, and if successful aspects of the Metro program are to be implemented as part of the Chicago School System's long-range plans.

2. Evaluation goals

The approach to evaluation described below is based on two principles that have come to the fore in recent evaluation studies. These new approaches correct some serious short-comings of older evaluation schemes:

Evaluation should measure not only the *outcomes* of educational programs but also the *processes of education* that lead to these outcomes (see, for example, Medley and Mitzell, 1965).

Evaluation should not only be summative (summarizing the effects of program at some point in time) but also formative (feeding information back into the program that contributes to its continual improvement). (See, for example, Burner, 1966 and Association for Supervision and Curriculum Development, 1967.)

Of course, the outcomes of educational programs, in terms of their effects on students, should not be ignored. However, without effective investigation of the actual process of education in the Metro school and the ways in which this process differs from traditional educational practices, differences in the effects of programs are difficult to interpret. Information about the process of education in the school must be combined with information about the effects of the school's program if evaluation is to constantly feed information back into the school's program to promote its continual improvement.

Seeking to apply these principles to the development of an effective evaluation of the Metro program has led us to undertake the following types of activities:

An analysis of the goals of Metro and of testing instruments that have been used previously to measure learning outcomes in these areas. The instruments we have chosen (usually with modifications for the specific nature of the Metro program) are discussed in detail in the section on evaluation procedures.

An analysis of various research methodologies that are appropriate to the different aspects of the evaluation procedure, including paper-and-pencil tests, performance tests, in-depth interviews, and systematic observation.

An analysis of different approaches to the research design and technical specifications for the evaluation procedure, including formation of control groups, subject selection, subject sample size, reliability of research methodologies, and alternative approaches to data analysis.

Interviews with experts in research methodology and research design to gain additional perspectives on the issues cited above.

Preliminary tryouts of some interview and paper-and-pencil tests with high school students.

In the light of these activities, we have developed the following proposed format for gathering the maximum amount of useful information about the Metro experience.

3. Subject population

The experimental groups include the 110 freshmen and 40 upperclassmen in the Metro High School. The fact that the 110 freshmen have been selected randomly from those who applied provides a rare opportunity for a powerful evaluation design, since random assignment of subjects to treatment groups is the most desirable experimental approach (see Campbell and Stanley, 1965).

In order to benefit from the desirable advantages of random assignment of students to Metro, it is necessary to form a control group of students who also applied to Metro, but were not selected in the random drawings. Thus, for each of the 110 freshmen selected another student from the same school who applied but was not accepted by Metro will be randomly chosen for the control group.

The testing of this group of students will involve considerable additional effort on our part, but we are convinced, on the basis of our own background in educational research and on the basis of our consultation with experts on research design, that this is by far the best way to set up the evaluation.

Data will also be collected on the upperclassmen in the Metro program, but the focus will be on the freshmen, since there is a clear control group in their case.

From among the 110 freshmen in the experimental group and the 110 freshmen in the control group, a sub-sample of 20 students from each group will be randomly chosen for more intensive study.

4. Pretest program

The pretest program will include three broad types of activities:

a. *Tests of reading and mathematics achievement.*—This achievement testing, which reflects the concern of the Metro program that students develop fundamental competence in reading and mathematics will be administered to all participating Metro students and to the control group. At present, two possible sets of tests are under consideration. One set is the Differential Aptitude Tests, the Word Knowledge subtest of the Metropolitan Advanced Reading Test. These tests are currently used in the testing program of the Chicago Public Schools for ninth graders. The advantage of using these tests is that achievement levels of experimental and control groups can be readily compared to other Chicago students. The other set being considered is the Sequential Tests of Educational Progress (STEP tests) developed by Educational Testing Service. The STEP tests have several advantages:

They are clearly achievement tests.

The tests have been employed in several large-scale evaluation efforts in the past (particularly Coleman, et al, 1966), so that a large body of information is available about test scores of students from all over the country.

Additional investigation and consultation is now underway to determine which achievement testing program would be preferable.

b. *General Attitude Survey.*—One testing instrument which will take approximately one hour to group-administer, is being prepared. It will be given to all Metro participants and to the control group. The purpose of this instrument is to gain an initial indication of the nature of the student body in a number of areas in which the Metro program hopes to exert some influence. Specifically, the following areas will be tested and the following testing instruments will be modified for inclusion in the general survey:

1. *Sense of control and autonomy.*—One Primary goal of the Metro program is to develop the student's potential for independent learning and for independent and autonomous action outside the school situation. Previous research has demonstrated that a sense of control and autonomy is significantly related to school achievement (Coleman, et al, 1966). We will employ a modified version of this Coleman scale.

2. *Self-image.*—The development of a positive picture of oneself as a person of worth is another fundamental goal of the Metro program. Gordon (1967) has produced the most satisfactory testing instrument to tap a student's image of himself. In addition, students will complete the Interpersonal Perception Method (Laing, Phillipson, Lee, 1966).

3. *Aspirations and interests.*—The development of student aspirations and interests is a keystone of the Metro program, as the discussion of students' programs in Section III has indicated. We have begun assessing students' interests and aspirations through a "Personal Inventory" that was returned by students accepted into the program.

In the general survey test, we will employ questions about interests and aspirations developed by Kandel and Lesser (1968) and by Gordon (1963).

4. *Cross-group contact.*—Another goal of the school entails the fostering of positive cross-racial contact and acceptance of the diversity of student background as a valuable resource in the learning process. One member of the Urban Research staff has developed a testing instrument in this area that he has employed in previous research (Wilson, 1969). A special version of the Interpersonal Perception Method (Laing, Phillipson, Lee, 1966) will also be administered.

5. *Relationships with peers and parents.*—Recent research in education has emphasized that the relationship between students, parents, and peers is a strong determinant of school performance and attitudes about school. In collecting baseline information about these subjects (including, for example, parents' aspirations for their child and the values of the student's peer group), we will rely

on the survey questions employed by Kandel and Lesser (1969) and Coleman, et al (1966).

6. *Past school experience and attitudes toward school.*—A student's school performance is, of course, conditioned by his past school experience and the attitudes he has formed toward school. Tests developed by Stern (1960) and Kandel and Lesser (1968) will be used to gain information in this area. Students will be asked these questions in the post-testing schedule to allow a comparison of their conception of their present school with their conception of the Metro program.

c. *Individual Interviews.*—An evaluative approach that has been particularly successful in the past involves collecting basic information about a large number of subjects and then selecting a subset of these individuals for more intensive analysis. This approach should be employed as a key part of evaluation of Metro. As outlined under "subject population," a subsample of 20 students will be selected in both the experimental and the control group. *Individual interviews with each student will probe more deeply in the major areas covered by the general attitude survey.* In developing questions for the individual interviews in each of these areas, we have drawn on the testing instruments that have already been cited in connection with the general attitude survey. In addition, we have employed several extensive studies of urban students that have relied on individual interviews. These include the work of Project Pathways, a longitudinal study of adolescent males now being completed at Harvard University (see Rosenthal, et al, 1966) and a study of students' attitudes toward schools and learning (Yanofsky, 1968).

5. Process study and analysis

The second major part of the evaluation will occur during the actual learning activities of the first semester. This study will record the educational process in Metro and compare it with the educational process experienced by the 20 students in the control group subsample. This component of the evaluation will have three parts:

a *Subsample Observation.*—The 20 students in the experimental group subsample and the 20 students in the control group subsample will be observed systematically in six different learning situations each for a period of forty-five minutes. The focus of these systematic observations will be on two questions:

The nature of the patterns of interaction within the learning situation. A scheme of observation developed by Flanders (1960) will be employed.

The activities of the subsample student during this period. A modification of a scheme of observation developed by White, et al (1969) will be used.

b. *General Observation and Interviewing.*—In the Metro program only, a different approach to observation and interviewing will also be used. The guidelines for this observational study are suggested by the work of Bruyn, *The Human Perspective in Sociology.* The observer will try to record as much as possible what is going on within a particular setting. Specific issues for observation will be specified in the light of questions and problems that arise as Metro develops. Often observation will be followed by interviews with participants in the events observed. For example, we will observe the staff member of a participating institution work with students, and then interview him about how things are going, what problems have arisen, etc.

c. *Student and Teacher Records.*—Participants in Metro will keep journals about the program. In addition, significant planning sessions and other discussions will be tape-recorded for later analysis.

6. Post-test

The post-test data collection will be undertaken at the end of the first semester and at regular intervals thereafter. It will follow the same general format as the pretest data collection described above, except it may be altered somewhat in the light of the ideas generated by the pretest and process evaluation. One specific addition to the post-test evaluation will be systematic interviews with all staff members, including both full-time staff and the staff members from participating institutions.

Timetable.—The following timetable has been developed for the completion of the various phases of the evaluation described in the previous pages:

January 1–15

- Final decision on achievement tests.
- Final preparation of general attitude survey.
- Final preparation of subsample interview schedule.
- Final preparation of subsample observation scheme.

January 15–30
Training of test administrators.
Pilot tryout of testing instruments.
February 2–14
Administration of all pretests to experimental group.
Initiation of observation of experimental group.
Initiation of journal keeping and recording of key interactions within the Metro program.
February 15–28: Administration of all pretests to control group.
March–May
Carry on all aspects of process evaluation.
Analyze all pretest data.
June
Carry out post-test program with both experimental and control groups.
Analyze all process evaluation data.
July: Analyze post-test data and prepare first evaluation report.

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To: Mrs. Evelyn F. Carlson, Associate Superintendent of Schools, Educational Program Planning.
From: Donald R. Moore, Educational Planning Associate for Evaluation, Urban Research Corporation.
Re: Elaboration regarding the proposed assessment program for the Chicago Public High School for Metropolitan Studies.
Date: January 21, 1970.

Several important points concerning the assessment plan presented in the Final Report of December 31, 1969 require further clarification, especially as they relate to the control group for the assessment.

First, the primary purpose of studying both an experimental and control group is not to make global comparisons of the outcomes of schooling for these two groups of students, but rather to gather information about differences in the

process of schooling in the two situations. Comparisons of outcomes would be made with extreme caution, taking into account the discrepancies between the resources available in the experimental and control situations. The information gathered is to be used to allow for the improvement of Metro by providing baseline information concerning a variety of specific questions that are crucial to understanding the nature of the Metro program.

For example, we need to find out how effectively the greater inputs of resources in the Metro program are being utilized as they are translated into educational experiences that affect specific students. Systematic observation will measure such variables as attention of students, nature of interaction with teachers and fellow students, amount of time spent on basic skills, etc. We can only decide whether the increased resources in Metro are being used effectively and how the use of Metro resources can be improved if we gather some baseline information on similar students in the traditional school settings.

To take another example, one aim of the Metro program is to give the student a much richer opportunity for the development of knowledge and attitudes concerning a vocation. Judgments as to the effectiveness of this effort and its improvement can be made with reasonable certainty only if we can gain insight into the development of vocational knowledge and attitudes in a group that is learning in the traditional setting.

Such information would be used, then, to answer a myriad of specific questions that relate to improving the Metro program. Interpretation of this information would take careful account of the differences in resources between experimental and control situations and would not be focused on global comparisons of educational outcomes.

A second valid question that has been raised is whether it is legitimate to compare the two groups after such a short time. These first two data collections are considered the first two points in a longer-range time series study that will hopefully follow students over the course of their high school education. We focused on the first two data collections in our report because they will take place in the pilot semester and because that is the period covered by the contract now being negotiated. The time series approach allows a much richer opportunity to study the patterns of development in students. It allows us to find out, for example, whether there is a falling off of development over a period of several years after an initial spurt in development.

Consideration of the measurements taken at the beginning and end of the pilot semester as points in a longer-range time series further emphasizes the point made above: It would be an invalid research approach to make blanket comparisons of educational outcomes in the initial stages of a time series study. Again, the emphasis will be on making cautious comparisons of outcomes and processes of education so that the information can be used to improve the Metro program.

This approach is a consistent extension of the two major goals of the evaluation outlined in the report of December 31:

Evaluation should measure not only the *outcomes* of educational programs but also *the processes of education* that lead to these outcomes.

Evaluation should not only be summative (summarizing the effects of a program at some point in time) but also formative (feeding information back into the program that contributes to its continual improvement).

A third question that has been raised concerns the specifics of the plan for assessment with the control group. We have developed a specific plan that we feel will minimize the inconvenience to the schools, even at some cost in staff time to us.

URC will take responsibility for conducting all testing, interviewing, and observations. The only obligation of the school system will be to help make students available for testing and to provide space for testing at individual schools.

The proposed plan and schedule is as follows:

February 15–28:

Achievement and paper-and-pencil attitude testing of students at their individual schools. 110 students. One three-hour period at the beginning of the day during which the two students at each school would be released and space provided at the school for testing. Individual arrangements to be made with each school as to exact day.

March 1–20:

Interviews with 15 students. Students to be released for two hours and interviewed individually at the school. Times to be arranged individually with schools.

March 1 to May 31:

Observation. Students to be observed in three classes on one day and three classes on another day. Times to be arranged individually with schools.

June 1 to June 20:

Achievement and paper-and-pencil attitude testing of 110 students. Interviews with 15 students. Procedures as outlined in connection with first data collections.

CHICAGO PUBLIC HIGH SCHOOL FOR METROPOLITAN STUDIES—A BRIEF DESCRIPTION, FEBRUARY 1, 1971

The Metro High School is an experimental four-year "high school without walls." The school has no conventional school building; it does have a headquarters in a downtown office building that serves as office space for staff, a student-staff work area, and a student-staff lounge. Metro students participate in learning experiences throughout the city—with businesses, cultural organizations, and community groups.

Metro is a Chicago Public High School with full-time responsibility for 350 students. Students who graduate from Metro fulfill all Chicago Board of Education requirements for a high school degree. The students come from every neighborhood in the city. They closely reflect the diversity of Chicago's school population in terms of ethnic background, interests, and previous school achievement. Students who are now attending Metro were chosen *randomly* from approximately 3,000 applicants.

The nature of Metro's educational program reflects a number of ideas about learning that the students and staff of Metro are testing and developing:

1. The possibilities for meaningful education are enhanced when such education occurs in real-life situations, including the businesses, cultural institutions, and neighborhoods of a city.

2. Students can learn from people with varied skills and interests—lawyers, electricians, artists, newspaper reporters. A skilled teacher can help a student use the talents of these people to gain a rich and individualized education.

3. An urban school must be developed with student involvement in decision-making. Students become more independent and motivated learners by helping make decisions about how their school will be structured and how their own education will proceed.

4. A fairly small learning community of teachers and students must be the basic unit to which the student relates. This community of learners must provide both constant support and constant evaluative feedback to the student regarding his directions for learning.

5. The diverse backgrounds of students provide a resource for education that should become an integral part of a school program.

To implement these innovations, Metro has developed a three-part program consisting of learning units, individual placements, and counseling groups.

The *learning units* are the basic learning experiences in the program. They are taught both by the school's full-time staff and by staff members of participating organizations. Some units deal with traditional subject areas, such as geometry and chemistry. Some units deal with basic skills such as reading. Well over half of them deal with topics that are not usually covered in a high school curriculum: Studying the current show at the Museum of Contemporary Art, studying probability with a group of insurance actuaries, learning filmmaking techniques from television film producers, and learning about a community's problems from a neighborhood organization. Except for a few distributional requirements, a student is free to choose whatever he wants from the Metro catalogue, which currently includes about 100 courses.

Individual placements are a recent development at Metro. They provide an opportunity for a student to find out about a place in the city in which he is interested, perhaps an occupation in which he thinks he might want to work. Individual placements have been made in secretarial pools, animal hospitals, zoos, preschools, industrial laboratories, community organizations, political campaigns, lawyers' offices, etc. Ideally, the student is given some real responsibility in the organization and an opportunity to understand how it functions overall.

Counseling group is, in one sense, the core of the program. This group consists of 15 to 20 students who meet for three hours each week. This time is devoted to group discussions and other group activities, individual counseling, and planning of the student's program. The counseling group allows students

from diverse backgrounds to become well acquainted by sharing past experiences and discussing present problems and future plans. It is the fundamental forum where students make themselves heard on decisions pertinent to the school's organization and curriculum.

These varied activities constitute a student's program; they may send him from one end of the city to another during a typical day. A typical student could begin his day interviewing inmates at a state prison as part of a course in "Penal Justice." He then heads for the Loop, where his counseling group meets in a conference room provided by Montgomery Ward. He ends the day photographing buildings as part of a class in city planning. His next day could consist of a math lab experience at Metro headquarters, a class in electronics at the telephone company, and a free period spent at the library or just relaxing at Metro headquarters.

A second student could have a completely different set of experiences chosen to suit his interests and abilities. His program might consist of a journalism course taught in part by practicing reporters, a physics course using lab facilities at the University of Illinois, a placement in a quality control laboratory in a chemical company, and a course in improvisational theater at Second City.

The Metro calendar is divided into four ten-week learning cycles. At the end of each cycle, the student sits down with each of his teachers, and they fill out a detailed evaluation of his work. The teacher, after consulting the student, gives him either credit or no credit for that ten-week learning cycle. Each learning unit fulfills requirements for graduation in a major subject matter area, like English. Thus, a student's year of English credit may (for example) come from work in filmmaking, creative writing, and American literature.

One interesting aspect of the Metro school is an attempt to evaluate the program's development carefully. This evaluation has two parts: (1) a long-term comparison of Metro students with a control group of students who applied to Metro but weren't admitted in the random drawing and (2) a short-term "formative" evaluation that attempts to provide information bearing on decisions that must be made about the school's development. The formative evaluation seeks to answer questions like the following: What do students think about counseling group? What are the characteristics of classes which students like? What are the most successful alternatives for getting information to students? How much interracial contact is there at the headquarters compared to six months ago?

Another interesting aspect of the school is the involvement, from the initial stages of planning, of outside consultants. Consultants from Urban Research Corporation of Chicago have worked on planning and carrying out all phases of the Metro program, including contacts with participating organizations, curriculum planning, staff development, teaching classes, student counseling, development of administrative procedures, and evaluation.

It is much too early to make any definite judgment on the success of the Metro program. Students and staff constantly confront difficult problems making the transition from traditional patterns of education. For example, some students have particular difficulty in taking the responsibility that comes with Metro's freedom. Teachers find it difficult to assume the multiple demands of their role: teaching, counseling, curriculum development, and making outside contacts. Crucial decisions confront the school concerning how to expand in size while maintaining a sense of community and a flexible program.

It will require several years of bold experimentation before the nature of the Metro experiment can be clearly evaluated.

METRO 4

A NEW DAWN

A SAMPLING OF THE COURSES TAUGHT AT METRO HIGH SCHOOL—
FALL AND WINTER 1970

220. Game Theater; Bob Curry, Second City (Fritz Hamilton)
Bob Curry, Actor and director, recently a Second City and successful character actor in Hollywood, will conduct an acting in game theater.

030. People of the U.S.; John Naisbitt, Urban Research Corp. (Jean Ashe)
An important encyclopedia has requested John Naisbitt of Urban Research Corp. to write a section of the encyclopedia called "People of the U.S.". Students will work with him to compile information for this article and to write it.

190. Black America; Eric Perkins (Paula Baron)
This course will be designed to introduce to the student the history of black people in the U.S. We will begin with slavery and the slave trade.

034. Stock Market & Economy; Henry Friedman, A. G. Becker & Co. (Chris Nugent)
This unit will introduce student to how the stock market works and to the basic principles of our economic system.

164. Let The Buyer Beware; Silas Brown, Consumer Welfare Corp. (Robin Smith)
Learn how to detect trick ads, trick pricing, trick language, signs; how the dishonest merchant cheats on sales, uses water in green vegetables and meats, colors meats and chickens, how they cheat you on financing and contracts, etc. Students will help detect these bad practices and will learn how to protect their dollars.

184. Penal Justice; Ned Rollo, Illinois Department of Correction (Fritz Hamilton)
Ned Rollo who has spent 3 years in a Louisiana State prison and is now a social worker for the Illinois Department of Correction, will teach this unit in which the class will visit and study the various criminal programs in Illinois—from courts, to prisons, halfway houses.

157. Math Applications in Business; John Akalaitis, Western Electric (Sharon Weitzman)
Accountants and engineers will work individually or in small groups with students. You will find how math is actually used in these men's jobs.

050. Marine Biology; Rick Vahan, Shedd Aquarium (Fred Jackson)
Students will learn the principles of biology through the study of marine life and through practical work in helping the aquaticists at the Shedd Aquarium.

210. Individual Lab Assistantships; Marc Masor, Fred Jackson
Spaces will be available in the laboratories of several corporations in the city for working either as a lab technician or as a research assistant.

Course Descriptions for Cycle 4—English

003. Beginning Story Workshop; Judy Quanbeck
Students use brainstorming techniques in class to develop creative ideas and images. Homework includes writing stories and poetry. Continuing course—new students accepted. (3 points)

005. Gizmo Reading; Linda Bryan
Individual and small group instruction in basic reading and writing skills. Continuing course—new students. (4 points)

007. Public Speaking; Vera Regulus
Students will concentrate on developing good speaking and listening skills by speaking before groups. Continuing course—new students. (4 points)

008. Rapid Reading; Linda Bryan
This is a course in speed reading which can increase your reading speed 3 to 5 times. We will use individual Rapid Reading kits and small group reading of articles and books.
Continuing course—New students (3 points)

009. John Starr's Acting Workshop; John Starrs (Fritz Hamilton)
Development of personality and stage technique through improvisation and exercises. Continuing course—new students. (3 points)

010. Breaking the Code I & II; Vera Regulus
This course is to stimulate student interest and concentration in reading development. Small group and individual sessions will be the method of instruction. Continuing course—new students. (3 points)

139. Psychological literature; Judy Quanbeck
Class will continue reading a book for each class meeting. Books might be *The Outsider*, *Down These Mean Streets*, and several contemporary European novels. Continuing course—new students. (3 points)

142. Expository writing workshop; Vera Regulus
This course emphasizes the language and writing skills that will not only meet the student's present needs in writing and speaking but will also provide a foundation for the more advanced language and writing courses which lie ahead. Continuing course—new students. (3 points)

143. Dramatic Reading; Linda Bryan
We will learn how to read out loud with feeling. This involves reading, understanding, voice training and the use of your body. We work with tape recorders and with each other. Continuing course—no new students. (3 points)

145. Library research; Fritz Hamilton
This is a survey course in which the students must solve problems relating to materials in a major library. Every area at the library shall be used—newspaper, microfilms, musical recordings, visual aids, card catalogue. Continuing course—new students. (3 points)

146. Exploring Films; Jerry Anderson
We will look at films, talk about films, read about films and write about films. We will talk to film critics and film-makers. Our range of films will include: Repeating course—new students. (3 points)

192. Chicago Through the Novel; Paula Baron
Students will choose to read 2 to 3 novels which take place in Chicago. Through the novel they will explore appropriate areas of Chicago by actual walks, talking with people in the area, etc. Continuing course—new students. (3 points)

195. Story Workshop—Advanced; Judy Quanbeck
Students use brainstorming techniques in a class to develop creative ideas and images. Homework includes writing stories and poetry. Continuing class—no new students. (3 points)

198. Fantasy Literature; Mary Ellen Seagraves (Judy Quanbeck)
Students will read different types of fantasy literature including poetry, children's literature, science fiction and discuss them in terms of escapism and relevance to the present. Continuing class—new students. (3 points)

200. Producing a Metro Newspaper; Paula Baron, Chris Nugent
Class will involve actual production of the Metro Free Press. Students are involved in a variety of activities including heavy emphasis on writing, makeup of newspaper, gathering advertising and making policy for the newspaper. Continuing course—new students. (3 points)

220. Game Theater; Bob Curry (Fritz Hamilton)
Students will participate in a class of game theater, Continuing class—new students. (3 points)

246. Acting; Bob Curry (Fritz Hamilton)
Students will participate in a class of improvisational theater. Continuing class—new students. (3 points)

251. Poetry Appreciation and Practice: Fritz Hamilton
Students will write, read, and listen to poetry and songs with poetic content. Appreciation rather than criticism will be the goal. Repeating class—new students. (3 points)

252. How a Book Gets Published: Patrick Donagly (Fritz Hamilton)
The staff of Follett's Publishing Co. will conduct a course on how a book is produced at Follett's, from the writing through printing, advertising and distribution. New course—new students. (3 points)

253. Children's Theater; Susan Esses (Fritz Hamilton).
This is a course in Children's theater in which students will eventually put on a children's play. New course—new students. (3 points)

254. Speech Through Sensitivity; Susan Esses (Fritz Hamilton)
Good speech will be developed through sensitivity and improvisational theater devices. New course—new students. (3 points)

255. Tom Long's Acting Workshop; Tom Long (Fritz Hamilton)
Tom Long, veteran Chicago actor who recently played at Drury Lane with Douglas Fairbanks, Jr. and was cast as Jacques in the Goodman Theatre production of "As You Like It," opens his acting workshop to Metro students. The aim will be to develop personality and ability on stage. New course—new students. (3 points)

256. Periods and Styles of Acting; Tom Long (Fritz Hamilton)
For students with previous acting experience, Tom Long, experienced Chicago actor who recently played with Douglas Fairbanks, Jr. at Drury Lane, will conduct an acting class built around the acting styles of the ancient Greeks, through the Elizabethans, to the present. New course—new students. (3 points)

257. Advanced Library Research; Fritz Hamilton
For college bound students with some previous experience in a library, this course requires that a student properly prepare a term paper using the resources of a major library. (College-bound students only). New course—new students. (3 points)

258. Sports and English: Stuart Bernstein (era Regulas)
This course will try through reading, listening, and going to sports events, to develop such skills as sports writing and announcing. New course—new students. (3 points)

259. The Poetry of Rock; Stuart Bernstein (Vera Regulas)
Course will study just what popular music is saying today. We will study soul, rock, and folk to discover what these people are trying to communicate. New course—new students. (3 points)
260. Language as survival; MaryWllen Segraves (Judy Quanbeck)
The course will emphasize the necessity of clear and effective communication in human relations. We will study the different ways men communicate through the various media. New course—new students. (3 points)
261. The Source; Robin Smith
Students will read and discuss the Source by James Michner which deals with the history of Palestine, Western religion with archeology. (See Robin for registration).
293. Dramatic Reading II; Gail Siegerdt (Linda Bryan)
What can you learn from reading out loud? In this course we will study how people can communicate through the reading of stories, poems, and plays. We will be using tape recordings and other devices in helping develop good reading techniques. Repeating course—new students. (3 points)
294. Group Discussion Techniques; Gail Siegerdt (Linda Bryan)
How many times have you been in a group situation where nothing ever gets done? In this course we will learn the *HOW* of a successful group meeting. We will be observing ourselves and other groups in action. Learn how to be a group leader!

COURSE DESCRIPTIONS FOR CYCLE 4—SOCIAL STUDIES

021. The Workingman in America; Paula Baron
Did you know that labor unions were an early day version of protesters? That possibly the first American sit-in was over a labor struggle? Chicago was and is a center for labor activity and struggle. This unit will explore problems of workers, their past, present and future. Students will tour, interview workers and speak with union leaders. (See Paula Baron for registration) Continuing course—new students. (3 points)
023. Ghettto game; Nate Blackman
The ghetto game is a learning tool that simulates many of the conditions and forces that are at work in the city. It is best played with about ten people who are divided into four teams—each of which represents a recial or economic group in the city. The game is played with pieces of a board. Allows for a wide range of situations to develop. Repeating class—new students. (3 points)
025. Halsted Street; Mike Nolan
Why are some neighborhoods of the city populated by one racial or ethnic group and others by a different group? What kinds of services are offered by different communities to their residents? We will use interviews and readings to answer these and other questions about Chicago in this unit. Continuing course—new students. (3 points)
027. History Without a Lot of Names and Dates; Chris Nugent
An introduction to history, continuing from last cycle. Students will choose their own topics to explore with tape recorders and other means. Topics can range from World War I to the Roaring '20's to the depression. Continuing course—new students. (3 points)
033. Drug Problem; Ronald Talbert & Safari House Staff (Chris Nugent)
This course, taught by ex-heroin addicts and professionals of the Illinois Drug Abuse Program spans the problem of drug usage today and what is being done about it. Rehabilitation Centers, Halfway Houses, Laboratores, etc. will be visited and studied. Continuing course—new students. (3 points)
034. Stock Market & Economy; Hank Freedman (Chris Nugent)
This unit will introduce students to how the stock market works and to the basic principles of our economic system. There will be some reading and writing assignments. To register. please see Chris Nugent. Continuing course—no new students. (3 points)
101. Action Orientation; Mike Jones (Don Baker)
How do you buy a house? A car? What do the code numbers on package 'O' meats mean? How do you read the "fine print" in a contract? What are advertising "gimmicks"? This unit is designed to make you a wiser shopper. Continuing course—new students. (5 points)

164. Let the Buyer Beware; Robin Smith
Learn how to detect trick ads, trick pricing and signs; how the dishonest merchant cheats on sales, uses water in greens and meats, colors meats and chickens, how they cheat you on financing and contracts, etc. Students will learn how to detect these bad practices and how to protect his dollar. Continuing course—new students. (5 points)

165. Comparative Theories of Government-Capitalism; Paula Baron
This cycle will focus on a study of what capitalism is and how it really functions. We will talk with bankers, corporation presidents and others involved in making the econimy run. Continuing course—new students. (3 points)

184. Penal Justice; Ned Rollo (Fritz Hamilton)
This is a survey course in the Illinois penal system, taught by Ned Rollo who has experienced the inside and outside of penology in both Louisiana and Illinois. Institutions from prisons from prisons through parole boards to halfway houses will be explored. Continuing course—new students. (3 points)

188. Psychodrama; Ron Criswold (Fritz Hamilton)
The students recreate the important moments of their lives in dramatic improvisations, a therapeutic device to make people more aware of themselves. Ron Criswold is a leader of psychodrama for the Illinois Department of Mental Health. Continuing course—new students. (3 points)

189. People of the 20th Century; Chris Nugent
A continuation of last cycles study of "growing-up" in the 20th Century. We will explore new areas of Chicaggo's neighborhoods and plan a return visit to Southern Illinois. Continuing course—new students. (3 points)

190. Black America; Eric Perkins (Paula Baron)
This course will be designed to introduce to the student the history of Black people in the U.S. We will begin with slavery and the slave trade and end with a discussion of the current state of the civil rights movement. We hope to use the resources available in the Chicago area, and any student suggestions for places to visit, speakers will be helpful. Suggested readings would be encouraged. Continuing course—no new students. (3 points)

222. Social Violence & the Process of Change; (Fritz Hamilton)
Dr. Peter Knaus & Staff of People's Information Center.
This course will study the roots of social violence and inequality, primarily on the community level, and what is being done about it. Dr. Knaus, who has a Ph.D. in political science from Northwestern University and now teaches at U. of I., Circle Campus, will direct a staff in conducting this course. Courts, jails, health centers and educational institutions will be visited and studied. Continuing course—new students. (3 points)

224. Law & Justice: A Lawyer's View; Darlene Cathcart (Chris Nugent)
This unit will begin with discussions about student rights, crime and justice. Additional topics will be selected by the class during the cycle. Class discussions will be based on outside reading assignments. During the course each student will be required to investigate an aspect of the legal system and prepare a paper or class report on his study. Continuing course—new students. (3 points)

262. Legal Problems of Underground Institutions; Victor Aron (Fritz Hamilton)
What are the legal difficulties faced by free schools, food co-ops, communes, Channel 44, Alice's Revisited, women's unions? Visit and learn from the Northwestern Legal Assistance Clinic that handles their cases. New course—new students. (3 points)

263. Legal Problems of the Oppressed; Mike Deutsch (Fritz Hamilton)
People's Law Office that tries primarily criminal cases for poor people, minority groups and political rebels will teach a course in the problems of doing so. The class will visit various court and penal institutions relative to the problems. New course—new students. (3 points)

264. Social Violence in American Society; Fritz Hamilton
This is a study of the American downtrodden—the criminal, the derelict, the drug addict, the insane, the oppressed, the political rebel, and relating institutions. Prisons, halfway houses, rehabilitation centers, political action centers, communes, etc. will be visited. Repeating course—new students. (3 points)

265. Juvenile Penal Justice; Ned Rollo (Fritz Hamilton)
A survey course in the Illinois Department of Corrections for juvenile offenders. Ned Rollo who has worked for the Department of Corrections will teach. Various institutions for juveniles (prisons, rehabilitation centers, courts, etc.), will be visited. Repeating class—no new students. (3 points)

266. Parent Management; Robin Smith
Group will discuss the problems of understanding and being understood by parents. Discussion will draw mainly on the personal experiences and observations of the students. New course—new students. (3 points)

292. Pictorial History; Toni Haugabrok (Mike Nolan)
A course designed to aid students in forming mental and pictorial images of historical events. Movies, discussions, selected readings, and drawings done by students. Students will be urged to produce a comprehensive sketchbook denoting major historical events. Sketchbook and drawing materials supplied by students. Continuing course—new and old students. (5 points)

COURSE DESCRIPTION FOR CYCLE 4—MATHEMATICS

035. Data Processing; Ken LeTraunik
Students learn how problems are solved with computers. A basic computer language called "Basic" is used to write simple programs. Continuing course—no new students. (3 points)

037. Computer Science; Ken LeTraunik
Programming an IBM 360 using fortran, and learning how computers affect today's life. Students should have a serious interest in computers, a knowledge of some algebra, and the desire to put in considerable time and genuine effort. Continuing class—no new students. (5 points)

149. Math Lab I; Sharon Weitzman, Pan Zettler
This unit will cover math at all levels of high school math, using SMP as the basic text. Will stress an atmosphere of students working at their own rate and one of students helping each other. (Math review for college test will be included in Math Lab this cycle) Continuing course—new students. (4 points)

150. Math Lab II; Sharon Weitzman, Pan Zettler
See Math Lab I. Continuing course—new students. (4 points)

151. Math Lab III; Sharon Weitzman, Pan Zettler
See Math Lab I. Continuing course—new students. (4 points)

156. Independent Study in Trigonometry; Sharon Weitzman
Use of logs and slide rule to study math applications which use the trigonometric functions in solving. Continuing course—new students with consent. (3 points)

157. Math Applications in Business; John Akalaitis (Sharon Weitzman)
Accountants and engineers will work individually or in small groups with students. You will find out how math is actually used in these men's jobs. Continuing course—new student with consent. (3 points)

158. Probability; Jeff Petertil (Sharon Weitzman)
Study of math needed to figure out probability in business and other places. First half of the course deals just with math, second part with applications. Continuing course—new students only. (3 points)

182. Independent Study in Geometry; Ken LeTraunik
Students work individually with guidance from (and frequent consultation with) Ken in the study of geometry. Continuing course—new students only. (3 points)

211. Mathematical Designs and Constructions; Ken LeTraunik
A unit in which mathematical concepts will be learned by making constructions. Beginning with simple ruler and straight-edge constructions, 3-dimensional models, and possibly geodesics. Be prepared to pay a lab fee of about $1.50. Students should have a fairly good knowledge of math. Continuing course—new students with consent. (4 points)

295. Approximation and Estimation; Sharon Weitzman
Students will estimate size, shape, and learn how to come up with convincing statistics. Applications will deal with problems existing in the city and at Metro. New course—new students. (3 points)

COURSE DESCRIPTIONS FOR CYCLE 4—SCIENCE

043. Animal and Human Behavior; Marc Masor
This class, held at the Lincoln Park Zoo, will study different types of human and animal behavior. It will use, as study areas, zoo animals, human social behavior, additional field trips, and special readings. Continuing course—new students. (5 points)

044. Chemistry; John Graff (Fred Jackson)
A study of the structure and physical composition of materials we use in everyday life. What's in the food we eat, the beverages we drink, and the air we breathe. Continuing course—new students. (5 points).

045. Introduction to Biology; Fred Jackson
An introduction to basic skills in biology. Students will be mini taught by students who have previously studied biology. The content will include anatomy and physiology. Continuing course—new students. (5 points)

046. Ecology; Marc Masor, Fred Jackson
The study of living systems in and around Chicago will teach basics of ecology. Will include work at the field museum, field work, film study, and lab work. It will be a good introduction to understanding how people and lower animals live within their environment and how they cope with it. Continuing course—new students. (5 points)

049. Human Body; Robert Rose (Marc Masor)
A thorough study of the human body making use of hospital facilities and teaching through the problems of medicine. Continuing course—new students with permission. (5 points)

050. Marine Biology; Rick Vahan (Marc Masor, Fred Jackson)
The students will learn the principles of biology through the study of marine life and through practical work in helping the aquaticist at the Shedd Aquarium. Continuing course—no new students. (3 points)

053. Introduction to Physics; Bob Dolmetsch (Marc Masor)
This course deals with fundamental concepts in physics. The lab experiences will deal with every day physical phenomena. The student may be asked to build physical structures relating to physical laws. Continuing course—new students with consent. (5 points)

162. Film Biology; Fred Jackson
The study of biology through film and discussion. Continuing course—new students. (2 points)

207. Evolution and Man; Elaine Andrews (Marc Masor)
A detailed study of the possible origins of man and the directions this evolution may take in the future. Activties may include films, reading special projects, etc. Continuing course—new students. (5 points).

209. Men, Women and Wonder; Linda Bryan, Marc Masor, Fred Jackson
A one cycle study of the biological differences between male and female in lower and higher animal forms. Will approach the subject with use of lecture, films, reading, and discussion. Continuing course—new students with consent. (2 points)

210. Individual Lab Asistantships; Marc Masor, Fred Jackson
Space will be available in the laboratories of several corporations in the city for working either as a lab technician or as a research assistant. Students must be willing to work independently part of the time. The science teachers will coordinate the class placement. A Seminar TBA. Continuing course—new students with consent. (5 points)

COURSE DESCRIPTIONS FOR CYCLE 4—GYM

127. Jazz Dance; Heidi Rankin (Lucinda Johnson)
Basic exercises and dance steps. Emphasis is placed on the exercises. Continuing course—no new students. (1 point)

216. Baton Twirling; Linda Bryan
Learn how to twirl a baton for fun and to form a majorette team. Continuing class—new students. (1 point)

220. Men's Volleyball; Jerry Prince
We will work on setting up offensive formations and defensive formations using AAV rules. New class—new students. (1 point)

227. Women's Volleyball; Jerry Prince
We will concentrate on the basic fundamentals of serving, setting up plays and returning serves. New class—new students. (1 point)

228. Men's Basketball; Jerry Prince
This cycle we will learn new offenses and defenses and what to do in certain situations. We will also have tournaments. Continuing class—new students. (1 point)

230. Folk Dancing; Rebecca Rosen (Jerry Prince)
Have fun while getting your gym credit! Learn Israeli, Greek, American and other kinds of folk dancing. Will not include any square dancing. Experience not necessary. Continuing class—new students. (1 point)

275. Tennis—Beginning & Advanced; Paula Baron & Jerry Anderson
This is open to both beginners and experienced players. If you're a beginner you'll learn how to hit the ball, serve, and score. If you've played before you can work on improving your game. Open to men and women. Each student should have his own tennis racket and clothes (shorts, sweat shirt, T-shirt, towel, shoes, etc.) Balls will be supplied. New class—new students. (1 point)

276. Men's Soccer; Chris Nugent
Basics of game of soccer. All students who expect to play soccer in the fall must sign up for this course or another team sport. Repeating class—new students. (1 point)

277. Women's Soccer; Chris Nugent
Here's your chance to romp in the park on two spring mornings, learn the fundamentals of soccer and get a credit in Physical Education. New course—new students. (1 point)

278. Women's Table Tennis; Jerry Prince
Learn to play ping-pong. Compete in tournaments against your classmates. New course—new students. (1 point)

279. Men's Touch Football; Jerry Prince
Start getting ready for next year. Learn basic fundamentals and offensive and defensive formations. New course—new students. (1 point)

280. Men's Softball
Fast way to build your muscles and have fun. A way to let off steam, learn teamwork. New course—new students. (1 point)

281. Women's Softball
Learning basic rules for playing softball by doing. Great way to loose weight and have fun; learn teamwork. New course—new students. (1 point)

282. Co-ed Bowling; Jerry Prince
Ever wondered how one ball can hit ten pins? Course is designed to help develop form, concentration. Continuing course—new students. (1 point)

283. Roll Your Own!!! Joyce Rozanski & Ginny Sorrels (Pan Zettler)
If you like to do daring things in Grant Park (doing wheelies on 8 wheels) join the roller skating class. Must bring your own wheels. New course—new students. (1 point)

Course Descriptions for Cycle 4—Music

055. Singing for Fun; Carol McClellan
Designed for students who want to sing for enjoyment and fun such song types as: folk, rock, spirituals, and contemporary pop songs. Continuing course—new students. (3 points)

056. Vocal Workshop; Carolyn McClellan
This course is designed for students interested in learning the various types of music as well as singing them. Students are expected to perform. Continuing course—new students. (3 points)

057. Basic Piano; Carol McClellan
Basic Piano is designed to interest and teach the student who has inclinations about learning how to play the piano. Continuing course—new students. (3 points)

059. Playing the Guitar; Ken LeTrannik
Learning to play folk guitar (with maybe a little Flamenco). No rock, jazz, or electrics. Continuing course—new students. (2 points)

060. Music Appreciation
Music Appreciation is designed for interested students to learn about composers and compositions of different periods of music such as: Baroque, Classical, Romantic, etc. Continuing course—new students. (3 points)

268. Afro-American Music
Designed for students who are interested in studying music of the African derivative culture such as: jazz, rock, blues, swing, folk, and spirituals. New course—new students. (3 points)
269. Avante-Garde (Jazz); Carol McClellan
Students interested in involving themselves about the evolution of jazz, how it came about, and where it is presently and the study of jazz performers, etc. New course—new students. (3 points)
270. Choir
Choir is designed basically as a performance course for students who like to sing and broaden their musical experience and knowledge. Continuing course—new students. (3 points)

COURSE DESCRIPTION FOR CYCLE 4—ART

061. Basic Photography; Donald Baker
A continuation of 3rd cycle photo course. Basic photo principles will be extended. Continuing course—new students. (4 points)
063. Ceramics—M; Paula Cofresi
This class is open to any student interested in discovering the many methods of building clay forms, both useful and decorative. Students will learn to a) throw on wheel, b) process of firing, c) preparation and application of ceramic glazes. Continuing course—new students. (3 points)
064. Contemporary Art Museum; Lois Scheelman (Jane Erickson)
Unit will involve the students going on field trips and working in a workshop. The field trips will encompass various Chicago artists' studies, giving the students a cross-section exposure to art being done in Chicago. The course will involve some reading and keeping a weekly journal. Continuing course—new students. (3 points)
138. Drawing and Composition; Paula Cofresi
Students will learn to draw from a life model, Begin to See and interpret 'form,' 'Space': Perspective: learn to draw still life compositions and landscapes. Continuing course—new students. (3 points)
213. Painting; Donald Baker
Painterly Mediums and techniques will be covered. Color theory and collage techniques will be dealt with. Students will supply their own paint sets. Continuing course—no new students. (3 points)
214. Visual Aid Production: Donald Baker
A course designed to teach students how to produce slide presentations and filmstrips. Color and Black and White processes will be covered. Continuing course—no new students (3 points)
242. Ceramics—TH: Paula Cofresi
Same description as for Ceramic-M—No. 063. Continuing course—new students. (3 points)
273. Film Making; Donald Baker
A course in basic techniques of film. Students will use story boards and scripts as sources for films. Students will purchase their own film. Documentary, instructional, and animated films will be covered. New course—new students. (3 points)
274. Fashion Illustration; Maureen Munson (Fritz Hamilton)
Maureen Munson, fashion illustrator and free lance artist, will teach a course in Fashion-illustration. Students will learn from practical experience and from visiting other fashion illustrators throughout the city. New course—new students. (3 points)
292. Graphic Arts and Television; Tony Sulla (Chris Nugent)
An exciting way to tell it as you want to in many artistic media. You will work with one of the most exciting graphic artists in the city. New course—new students. (3 points)
296. Introduction to Art Institute; Nancy Denig (Paula Cofresi)
Contemporary American painting and sculpture, African masks, Indian Buddahs, Medieval alter pieces and panels, pre-Columbian feather ponchos, Japanese prints and screens, French impressionists paintings. The Art Institute is a treasure house filled with art works such as these and many others. This course is set up for students interested in discovering what the museum is about. Activities may include making giant collage map, art projects and organizing exhibition at Metro. New course—new students (3 points)

COURSE DESCRIPTION FOR CYCLE—FOREIGN LANGUAGE

067. Aprendamos Esponol en la Comunidad; Paula Cofresi
This course will offer a variety of experience for student interested in learning to speak Spanish in the Spanish community (Puerto Rican; Mexican: Cuban); for students who already speak a bit. Students may become involved in community work through individual project. Continuing course—no new students. (4 points)

068. Speaking Spanish the Native Way I; Cindy Suhwell (Jean Ashe)
Learning basic conversational structures from real life situations. Basic grammar where necessary. Performing short plays, writing dialogues, visiting and taking active part in the Spanish community. Lab work for self-improvement. Periodic tests to evaluate learning. Continuing course—no new students. (4 points)

069. Let's Speak German—Sprechen Wir Einander I–II; Martha Nelson (Jean Ashe)
Learning basic conversational structures, from real life situations, basic grammar skills where necessary. Performing skits—writing compositions, visiting and taking an active part in German Community. Lab work, independent project, periodic tests to evaluate progress. Continuing course—no new students. (4 points)

080. Beginning French: Robin Smith
Nous continuons nos etudes de la langue francaise. Continuing course—no new students. (4 points)

081. Intermediate and Advanced French: Robin Smith
Nous continuons avec la langue et la civilization des francophones. Nous allons lire davantage la litterature francaise et francoafricaine. Continuing course—no new students. (4 points)

148. Speaking Spanish the Native Way II; Cindy Suhwell (Jean Ashe)
Learning basic conversational structures from real life situations. Basic grammar where necessary. Performing short plays, writing dialogs, visiting and taking active part in the community. Lab work for self-improvement. Periodic tests to evaluate learning progress. Continuing course—new students with consent. (4 points)

212. Aprendamos Espanol en la Comunidad; Paula Cofresi; (For Beginners)
Students will begin and continue to learn to speak and write Spanish and attempt to understand the different Spanish Speaking communities in Chicago. Continuing course—new students with consent. (4 points)

267. Swahili; July Quanbeck
First conversations in Swahili with studies in East African culture. New Course—new students. (3 points)

COURSE DESCRIPTIONS FOR CYCLE 4—ELECTIVES

071. Drafting and Design; Jerry Anderson
This course is open to both experienced and inexperienced students. Those new to drafting will learn drafting fundamentals. Those who have had previous drafting experience will have the option to work in such areas as architecture, car-design and machine drafting. Continuing class—new students. (5 points)

176. Girl Talk; Lucinda Johnson
The course involves case problems concerning young ladies with their parents and friends. Make-up and poise training is included in the unit. Continuing class—no new students. (3 points)

218. Flying; Bob Tallot (Chris Nugent)
Principles of flight, navigation, weather, air law, preflight planning, flight logs and preventive flight maintenance. The class will be lecture and discussion. There will be reading required for credit in the course. Continuing course—no new students. (3 points)

223. Mechandising; Miss Bakanowicz (Lucinda Johnson)
In an informal setting students will get an in-depth view of how a retail store is set up and operated. Tours will be given in the store to get a visual concept of its operations. Continuing course—no new students. (3 points)

225. Records & Recording; Lou Everett (Jerry Anderson)
An inside look at recording and record albums are made. Visits to Chicago recording studios, listening in on recording sessions, watching mastering, pressing assembly operations. Opportunities to talk to the people in Chicago who make things happen in the record industry. Also a chance for the class to produce a record from original tape recording to finished record. Continuing course—new students. (3 points)

244. Drafting & Design; Jerry Anderson
This course is open to both experienced and inexperienced students. Those new to drafting will learn drafting fundamentals. Those who have had previous drafting experience will have the option to work in such areas as architecture, car-design, and machine drafting. Continuing class—new students. (5 points)

285. Animated Film-Making
Students will make animated films by drawing directly on clear 16 mm. film. Ink, paint and magic markers can be used. Be prepared to spend $5.00 on film and other supplies during the cycle. New course—new students. (3 points)

286. Group Process; Pan Zettler
This will be an unstructured group whose emphasis will be on interaction between members of the group. (See Pan Zettler before signing-up for this unit). New course—new students. (3 points)

287. Volunteer Tutoring Services; Ruth Wilson (Carol McClellan)
Tutoring services in this program enriches the students' experiences as well as helping others to develop and grow educationally in reading subjects. New course—new students. (5 points)

288. Crochet; Barbara Spears (Jean Ashe)
Have you always admired articles which were crocheted and wondered how they were done? Here's your chance to find out. You'll learn how to make many of the clothing articles you dreamed about. Fashion show at the end of cycle to show your projects. Must supply your own materials. New course—new students. (2 points)

289. Independent Programmed Studies; Judy Quanbeck
Programs available in insurance, medical terminology, systems analysis, accident prevention, refrigeration, fire inspection, accounting, math, algebra, geometry, calculus, trigonometry, statistics, computer, steno-speed, conducting interviews, salesmanship, disease classification. See Judy Quanbeck for details. New course—new students. (2 points)

290. Macrame: Liz Koenen & Joyce Rozanski (Robin Smith)
Learn How to make the knots in order to make neckties, belts, bags, etc. Students must supply their own equipment. Continuing course—new students. (2 points)

291. Shorthand: Toni Haugubrok
This course is designed to aid students in basic writing skills in Gregg shorthand. New course—new students. (3 points)

BACKGROUND NOTES SUBMITTED BY R. A. BECHER, ASSISTANT DIRECTOR, THE NUFFIELD FOUNDATION, LONDON

1. The first general thesis I should lie to advance is that the scientific approach—which has proved of undeniable value in many fields of human endeavour—is of limited relevance in education. My own experience over the past decade (both in helping to set up a succession of Nuffield-sponsored projects in curriculum development and educational innovation, and in planning the initial programme of the National Council for Educational Technology) has led me to doubt the assumption that the most rational procedures will always be the most effective and that individual divergences in attitude and value can be readily assimilated within a common framework. I have now come to believe that education—because its basic subject-matter is people rather than things—is inevitably subject to socio-political influences which are capable of running counter to a theoretically tidy, logical plan of action.

2. My second general thesis is that innovation has some important similarities with learning itself. There is a fairly obvious sense in which an individual teacher, or even the educational system in a more general way, is in the position

of a learner when trying to assimilate change. Let me pick out some now-familiar elements of our knowledge about learning which may prove relevant to the management of innovation:

(a) *Understanding of general goals and purposes.*—Just as it helps a student to know at the outset something of what it is that he is aiming to learn and for what purpose, so those concerned with promoting educational change need to explain what any proposed innovation may be expected to achieve and why the goals they put forward are worth pursuing. There is little point in jumping on a bandwagon unless you know where it is going and want to go there.

(b) *Relevance to existing needs.*—Part of the art of good teaching is to start from where the student is: you cannot expect him to make too large a leap from his own experience to something totally unfamiliar. So too, if the general climate of educational opinion is not in favour of a particular change, those who believe it worthwhile have to proceed slowly and in small steps, starting from the present perceptions and perspectives of teachers. If some suggested change seems to most teachers to have little to do with educational needs as they see them, neither orders nor exhortations will make much impact.

(c) *Motivation.*—It is a commonplace that students learn more effectively if their interest is stirred. Similarly, educational innovators need to take seriously the question of how to engage the personal and professional enthusiasm of the people most likely to be affected by any given change.

(d) *Active involvement.*—There is evidence to suggest that active learning, in which the student has to think and act for himself, is more satisfactory than passive learning, in which he merely assimilates the ideas of others. One can also notice that innovations in which those directly affected are actively caught up and given responsibility tend to be more effective than changes in which they are merely told what to do by someone else.

(e) *Support and reinforcement.*—Change, like learning, can be a painful process; those undergoing it may often find themselves assailed with doubts. Many students need the encouragement of being told that their mistakes are understandable ones, and that they are making good progress along the road towards the particular goal they are pursuing. Likewise with innovation: the participants, because they are in an unfamiliar situation, may feel unsure of themselves and need outside encouragement and support. Lack of this kind of reinforcement at the right moment may make all the difference between innovating successfully and failing altogether to change.

(f) *Accounting for individual differences.*—One of the biggest mistakes which can be made in education is to assume that there is a unique best answer to every problem. In fact, individual differences between learners are such that no single solution is ever applicable to them all. Part of good teaching comprises knowing which strategy to adopt at which particular time with which particular student; it is certainly not a matter of finding the elusive philosopher's stone to turn all base metal instantaneously into gold. The same is true of innovation; no one formula can ever be found to suit every possible combination of circumstances. So any change, to be effective, must be adaptable enought to accommodate itself to differences between individual school districts, individual schools and individual teachers; and any change agency, if it is to succeed, must recognise and be able to take into account these differences.

3. What particular implications have these two general theses for the work of the proposed National Institute? The main one, in my view, is the need to regard educational research and development as subject to consumer influence. Change agencies must move from their present product-oriented stance towards a market-oriented one. This means paying more than mere lip-service to institutional autonomy, and institutonal involvement in change, at the level of the individual school. It implies a major effort focused on school-based retraining programmes for teachers, even if one wants to ensure no more than an adequate pay-off for past research and development efforts.

4. The United States' educational system is fortunate in already possessing a network of Research and Development Centers and Regional Educational Laboratories. In my own view however, they will need in the future to be given greater freedom to develop their own entrepreneurial activities: their work needs to be less closely tied to centrally-determined policies. Because they need time as well as space in which to grow, governmental reviews of their activities should be less frequent than in the past (taking place, perhaps, once in every four or five years): support for them should be guaranteed, at some

agreed minimum level, during the intervening periods. Such an arrangement need not, however, undermine a firm policy of rewarding success and penalising failure.

5. As the central point in this network of change agencies, the National Institute itself should, I suggest, seek to establish a non-directive, co-ordinating relationship with the regional laboratories and centers (who would in their turn be expected to establish a similar relationship with client school systems). I would see the National Institute of Education as engaging in three main types of activity. The first—and in my view the most urgently needed—would be to explore new patterns, which could subsequently be developed and adapted by other, less broadly-based agencies, for school-based teacher training and subsequent consultancy work directly arising from this. The second would be to maintain and extend existing nation-wide communication networks, and to create new ones where necessary, building on the pioneering efforts of ERIC, the REL's and the R & D Centers. The third—following on from, rather than preceding, the other two—would comprise the funding of new development programmes for which there was clear evidence of client need.

6. The authority for the NIE's work would, on this basis, derive not from some central and paternalistic assessment of what is likely to be best for the nation's schools, but from the active support of those in the field. The learners—(the client institutions)—would need to display their readiness to learn (to innovate) at any given time, with the teachers (the change agents) providing wise and unobtrusive leadership and guidance. Only thus, I believe, can educational research and development depart from the mechanistic stance which has characterised it during the past decade towards a fuller recognition of humane values. Because people are not machines, they cannot simply be manipulated and engineered and still retain their integrity and self-respect. So effective educational change must be recognised as having to remain, to some extent at least, an untidy, unscientific, human process. This recognition should surely underlie and inform the establishment of a major national agency of the kind now proposed.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE—ANNUAL MEETING 1971

Section L (Education), 10 a.m., September 3, 1971

THE DISSEMINATION AND IMPLEMENTATION OF EDUCATIONAL INNOVATION

(By Antony Becher, Assistant Director, The Nuffield Foundation)

SUMMARY

Changes in the substance, as opposed to the structure, of education have tended until recently to be localised and piecemeal. But as the demand for education has increased, and with it the pressure on available resources, the need has been recognised for a more systematic approach to innovation. A number of agencies have emerged whose function it is to promote planned educational change: the paper questions their underlying assumptions, examines their mistakes, and speculates on their future role.

It begins by outlining three models of innovation derived from R. G. Havelock's recent survey. The first, research and development and diffusion, assumes a logical sequence of activities—the application of research, the design of prototypes, field trials, revision, mass production, dissemination and eventual implementation. Here the change agent's role is to produce and promote packaged solutions. The second, the social interaction model, focuses on professional and personal contacts in the process of disseminating innovation, with the change agent as a co-ordinator and communicator of ideas. The third model, problem-solving, emphasises the prior identification of the client's needs, with a non-directive change agent searching for ways of meeting these needs and adapting the solution to the client's own circumstances. The three models are not mutually exclusive, but most innovations exemplify one to the exclusion of others. Some innovative programmes are discussed in the light of these models to exemplify the practical difficulties of each.

Structural changes in the educational system are usually the result of national or local policy decisions, and their implementation depends on the acceptance

of central directives. But since the 1960's there has been a growing concern with qualitative rather than quantitative improvement, and a corresponding shift of responsibility from the centre to the periphery. The new agencies concerned with changes in the educational process first adopted a research, development and diffusion model, in which acceptance of new ideas depended on rational persuasion. It was assumed that if a practical solution could be developed for any problem, a significant number of those concerned would passively accept the given solution. It was also assumed that the applicability of the solution could be made independent of individual differences between users.

These assumptions are, in retrospect, questionable. Although the costs of a research development and diffusion programme are high, and have therefore to be justified by widespread adoption, examples are given of major American and Swedish curriculum schemes whose undoubted quality has not been matched by a sufficiently large consumer take-up. Moreover, even the early British schemes which attracted a sizeable following are often not applied in the way their originators intended. The notion of "user-proof" materials cannot be sustained: individual differences in teachers' skills and attitudes cannot be ignored.

Since the research development and diffusion model appeared unsatisfactory in terms of implementation, attempts were made in the mid-1960's to give more emphasis to social interaction. The first exemplars of this trend were in the primary school sector, which had earlier accomplished a major revolution in teaching methods as a result of the social interaction process. But some secondary school projects also adopted the same basic pattern, with the central team concentrating on building up a network of co-operating teachers and collating and disseminating the ideas they put forward.

Again, certain defects of the model began to emerge. First, it proved over-optimistic to expect that all teachers were sufficiently energetic and creative to develop their own coherent programmes from a set of stimulating suggestions. Projects where the central team departed from the pure form of social interaction to provide systematically developed supporting materials tended to survive: those which placed this burden on the individual user did not. Secondly, the extensive communication networks originally built up were liable to fragment, resulting in more localised networks which perpetuated the original innovation only in a mutated form. The mushrooming of teachers centres during this period encouraged local initiative and provided much-needed links between different sectors: but it also resulted in costly duplication of effort and in some materials of very moderate quality. A number of teachers have apparently felt trapped by the democratic apparatus of locally-based innovation, have resented this fact, and have ultimately rejected its products.

In the 1970's, more attention is likely to be paid to the problem-solving model. Because this places the client at the centre of the innovative process, educational change is likely to develop a market orientation, in contrast with the product orientation of the past decade. Innovative agencies will increasingly supply consultancy services rather than ready-made solutions. Two examples are given of this emergent pattern: the recent NCET proposals for a learning programmes project in colleges of education, and the newly-formed Nuffield Group for Research and Innovation in Higher Education.

The problem-solving model, contrasted with the research development and diffusion model, is less paternalistic, taking greater cognisance of the clients' autonomy and individual differences. By the same token, it makes heavier demands on them, and implies the need for a much-increased effort in the continuing professional development of teachers. An innovation using consultancy techniques is heavily labour-intensive. To offset the costs, some way must be found to transfer the results directly from one client to others with similar problems. Social interaction strategies may prove useful in this context. Again, because it is economically impracticable to develop a tailor-made solution to every individual client's needs, problem-solving must assume the availability of a wide range of products of research, development and diffusion. However, these products can only be useful insofar as they are amenable to local adaptation.

In conclusion, it is suggested that successful innovation must rely on a judicious amalgam of all three of Havelock's models. The inevitable tension between centre and periphery in any process of planned change can best be resolved if central development is seen as providing a carrier wave on which innovation can be locally modulated. A new scheme of resource management,

role structures and professional development must be created which allows autonomy at various levels in the system and helps individual constituents to cope with it. This promises to be the pattern most sensitive to the need for continuous improvement in the quality of education.

In this paper I would like to consider change in education from the point of view of the various agencies for innovation which now exist outside the individual school or other educational institution. Until some ten years ago, educational change—and here I do not mean changes in the structure of the system, but changes in its substance—normally took place without any very systematic planning Specialist teachers' associations; the local education authorities; H. M. Inspectorate; and very occasionally the Ministry itself—all these together with a great many individual practitioners were, of course, in various ways concerned with improving the quality of education. But the changes they helped to promote were gradual, sometimes relatively marginal, often highly localised, and above all seldom articulated one with another.

During the last decade, there has however developed a different way of looking at the change process in education. As the demand has grown—for education of better quality for larger numbers over a longer time—the pressure on available resources has greatly increased. This in turn has called out for a more systematic approach to innovation. It has become increasingly evident that we can no longer afford to stumble from one crisis to another, muddling through as best we may: we have to think ahead, to plan carefully, to work out priorities, and to find the most efficient ways of meeting them. Change is no longer a matter of random evolution: it has become a question of social engineering. And so there have emerged, in Britain (as in the U.S.A. and in Scandinavia) special agencies for promoting planned change: the Schools Council and the National Council for Educational Technology supported by the system itself, the Nuffield Foundation and other bodies with an independent status and sponsorship.

It is to agencies such as these that I would like to direct particular attention. I want to question some of the assumptions behind their earlier work, to examine their mistakes as well as their successes, and to speculate about the direction in which such agencies might best go in future. Before I do so, however, it may be useful briefly to set out three alternative models of the innovation process. They are derived from the work of Ronald Havelock at the University of Ann Arbor, and represent the synthesis of an extensive study which he carried out of the literature of educational change. He designates them in turn as the research, development and diffusion model; the social interaction model; and the problem-solving model.

The first of these is the most obviously tidy-minded. It assumes that all planned change must begin with research: or at least, if not with basic research, then with the study of all relevant available results of such research, and their translation into practically applicable terms. The next stage is to develop appropriate solutions to any given problem in the light of this preliminary study, to test out these solutions and then to revise them as necessary. Once a valid solution has been developed, it needs to be put in a form suitable for its general application: and once "packaged" in this way, it must be reproduced in sufficiently large quantities, disseminated widely through the relevant parts of the educational system, and implemented in as many institutions as are likely to benefit from it.

The second model, in contrast with the first, offers a retrospective description of the innovation process. It stresses that individuals or groups who decide to implement a particular change are influenced mainly by their own network of social relationships. Those nearer the centre of such a network are more likely to accept new ideas; informal personal contact plays a vital part; and membership of a particular association or reference group will itself increase the chances of taking up a particular change. The social interaction model also provides a standard projection of the rate of adoption of change, in terms of an S-curve pattern—a slow beginning, followed by a period of quite rapid diffusion, followed by a long tail of late adoption.

The third model, similarly, focuses on the process of deciding whether to adopt a particular change rather than (as in the first) planning to bring it about. But this time it is concerned, not with the social influences on adoption, but with the practical problems which face individuals or institutions in their daily work. The thesis here is that effective change begins with a sense of need felt by the client system. The initial need has then to be translated into some identifiable problem: once a problem has been diagnosed, there takes place a process

of search and retrieval of ideas and information which can help in deciding what change to introduce. This search process may well involve outside agencies acting as consultants. Finally, when a potential solution has been identified the user has to adapt it to his particular circumstances, try it out, and decide the ultimate form in which the solution is to be generally applied.

The contrasts between these models can best be brought out, for my present purposes, by distinguishing between the different roles occupied within them by central innovative agencies or their project teams. In the research, development and diffusion model the external change agent is concerned mainly with preparing and disseminating packaged solutions. In the social interaction model he concentrates on identifying and strengthening communication networks and promoting the interchange of ideas. And in the problem-solving model he acts as a resource consultant, working in a non-directive relationship with his clients.

Of course, the three models do not need to be seen as mutually exclusive: it would be perfectly reasonable, for instance, to start with the problem-solving model, to find that many individuals or institutions experienced a common need, and then to realise that effectively to meet this need would demand a programme based on research, development and diffusion. The implementation of the new solution produced in this way might well follow in its turn the social interaction model—so that a change process which started from considering a client's needs could well end with a systematically developed product whose effective diffusion depended on taking fully into account the appropriate pattern of existing social relationships.

Nevertheless, although the three models can be superimposed one on the other, any particular innovation will often be dominated by one to the exclusion of the other two. I would like now to look at a number of actual instances which may help to bring this abstract discussion to earth, and to underline some of the practical difficulties which seem to be inherent in each.

I suppose one of the key questions about any educational innovation is who should decide whether or not to introduce it. Should it be the individual teacher (or, more radically, his students—the ultimate beneficiaries of the educational system); should it be a collective decision on the part of practitioners—either in a department or an institution or in some appropriate professional group; or should it be some central agency—the LEA, the Regional Advisory Council, the UGC, the DES? A moment's reflection may suggest that different kinds of change require different sources of decision. Nevertheless, in very crude terms one can begin to detect an historical shift of responsibility from the centre to the periphery, from the governing administration to the individual institution. And I would suggest that this shift implies some recognition (at the unconscious if not the conscious level) of the limitations of an authoritarian or paternalistic approach to the implementation of change.

Many of the major educational innovations since the war have been ones which affected the form, rather than the substance, of the educational process. They were often the results of national or local policy decisions—not, of course, since ours is a formally decentralised system, decisions taken in isolation in a room in Curzon Street or County Hall, but decisions resulting from a more or less elaborate process of consultation. Nevertheless, their implementation depended on the acceptance of general instructions from the centre: instructions to colleges to train more primary school teachers; to universities to expand their student numbers, particularly in science subjects; to secondary schools to provide for the whole range of academic ability rather than for a limited sector of it; and so on. Although many of these instructions were readily accepted, as corresponding to a recognised economic or social need, they were notably concerned with quantitative rather than qualitative issues: with extending the scope of the educational system, but not especially with improving the nature of the teaching and learning which took place within it.

With one major exception—the nursery and infant schools—it was not until the 1960's that a number of general dissatisfactions began to be expressed with the actual process of education. Often, to their credit, these dissatisfactions emanated from the teachers themselves: specialists in science, for example, began to complain about the ossification of the traditional examination syllabuses which took no account of recent advances in knowledge; and language teachers began to be concerned with the fact that their students could not, even after long periods of study, communicate effectively in a foreign tongue. At

other times, the dissatisfactions sprang from the student, notably those more articulate university undergraduates who began to protest about what they saw as the poor quality of their teaching provision.

A number of change agencies first came into existence, and a number of already existing ones began to develop new programmes, in response to this situation. Almost without exception, they settled unhesitatingly for a research, development and diffusion model: one which depended, not on ordering people from a position of overall authority to do this rather than that, but on a process of rational persuasion. It was assumed that, if a sensible solution could be devised centrally to meet a particular problem, the clients struggling with that problem would gratefully, and passively, accept the solution. They would accept on its own terms what was made available from the centre—whether it be a new O-Level Chemistry programme, a scheme for teaching French in primary schools, or a project for introducing the concepts of modern mathematics into the secondary syllabus. The products were intended to carry with them their own teaching message: so that, once a scheme had been carefully developed, tested, revised, and found to be workable, it could simply be put on the market in the confident assumption that it would be widely taken up and implemented in the way its originators had intended.

It is worth underlining two assumptions implicit in the use of this model—which was, incidentally, the one most characteristic of the first curriculum projects sponsored by the Nuffield Foundation in the early 1960's, and also those initially supported by the Schools Council. The first assumption was that individual differences among potential users were less important than their underlying similarities: that once a systematic solution had been devised to a particular problem (by getting together teams embodying all the required experience and expertise, and by subjecting their products to extensive developmental trials), that solution would necessarily be valid for all situations. In other words, the results were expected in some sense to be proof against individual variations in circumstance: a standard pattern could be evolved which would work happily in almost any situation. The second assumption was that potential users would be ready in significant numbers unquestioningly to adopt the results of such development. For if this were not to be the case, it would be difficult in economic terms to justify the heavy investment demanded by the research, development and diffusion model—first an investment in manpower (the development programme itself usually demanded some 25 to 30 man-years, and the central teams consisted of hand-picked and highly qualified people); and second, an investment in production costs (materials had to be produced in increasing numbers for initial trials, wider field testing, and final publication). Only by concentrating resources in this way, it was argued, could a product be developed which combined high quality with large-scale appeal—and the expense of its development justified in terms of its wide applicability.

In the event, history suggests that both these assumptions were mistaken. It is true that many British curriculum programmes based on the research, development and diffusion model appear to have been more successful, in terms of general adoption, than some of their American and Swedish counterparts. For example, the Nuffield O-Level Science materials were, it was recently estimated, being used in one form or another in at least 45% of schools with O-Level streams within five years of initial publication. The Nuffield primary French materials have apparently scored a similar success. In 1962, a nationwide survey showed that French was then being taught in only a small handful of maintained primary schools; it is now, five years after the publication of the first stage of the Nuffield scheme, a regular part of the curriculum of more than half such schools. In contrast, the American PSSC Physics Programme, whose total development costs ran into tens of millions of dollars, and the excellence of whose materials is undeniable, is still, after more than ten years on the market, only used in some 10% of U.S. high schools. The Swedish IMU Mathematics scheme, introducing modern mathematics through self-instructional methods in secondary schools, has—after the most elaborate development and evaluation programme involving some 11,000 trial students—been virtually abandoned as educationally and politically impracticable.

Our own experiences in applying the research, development and diffusion model have been less discouraging than either of these. They have nevertheless clearly brought out the difficulties of assuming that potential users of materials are prepared passively to accept what is offered them from the centre, rationally

to follow the recommended procedures, and successfully to implement the proposed design. When one looks behind the statistics—the numbers of adopting schools, and the rates of sales of materials—one finds a surprisingly large variation in the actual methods of use. Far from "getting the message" implicit in the work of the development team, many teachers have superimposed their own very different interpretations and philosophis. Thus one comes across cases where materials (for example those of Nuffield O-Level Physics) essentially devised to exploit discovery methods are in fact being used in traditionally didactic ways; and others where materials (for instance those for audio-visual language courses) designed to encourage active pupil participation, are being employed largely for passive role learning. It turns out that not even the most carefully designed materials are "user-proof" in the sense that they clearly carry their own implications and are impervious to individual differences in the skills and attitudes of the teachers who use them.

The early 1960's, then, taught the new agencies concerned with planned educational change a good deal more about the ways to develop innovations that about the ways in which, once developed, they might most effectively be implemented. The problem of implementation was in fact hardly then recognised to be a problem—it was simply assumed that successful adoption would follow logically and inevitably from successful initial development and trial and subsequent revision and mass production. But by the mid 1960's there were already signs of a shift of emphasis from the research, development and diffusion mode towards a pattern more characteristic of the social interaction model. It is perhaps significant that the forerunners of this new trend were the curriculum projects which concerned themselves with the primary age group. For, in fact, the earliest example of successful and widespread educational innovation during this century was the result of a grass-roots movement among primary school teachers. Nobody consciously planned this movement, but its existence, and its consequences in terms of a revolutionary change in teaching methods, are already well enough documented in the Plowden Report and in a host of other writings about the British primary school. Its fame has long since spread across the Atlantic and resulted in a steady stream of American observers, most of whom (for some odd reason) seem to end up in Leicestershire.

It is not my purpose now to dwell on this phenomenon, beyond saying that it provides a textbook illustration of the process of social interaction, and that it certainly influenced the pattern of operation of the Nuffield Junior Science Project (and, to a modified extent, the Nuffield Junior Mathematics Project). As a result, their concern was less with producing a package of pupils' materials, and more with involving large numbers of teachers in rethinking their own aims and replanning their own activities. The project teams, rather than beginning by developing a complete curricular pattern and embodying this in trial versions of students' texts with accompanying teachers' guides, started by culling examples of interesting current practice and weaving these together into source books of ideas on which interested teachers could draw.

A similar pattern was later adopted at the secondary level by one of the early Schools Council projects, Project Technology. Again the efforts of the central team concentrated on bringing together suggestions for new activities in technological education and on building up a network of co-operating teachers who could participate in training programmes, in local development work, and in spreading the gospel to colleagues in their own areas. I have already remarked on the difficulties that were by this time beginning to be experienced by projects based mainly on the research, development and diffusion model, in implementing their results effectively beyond the trial schools that enjoyed a special relationship with the central team. So it might have seemed that the social interaction model would provide a sounder innovative strategy.

But at this point two interesting things happened. First, there began to emerge a fairly sharp distinction between those projects where the central team saw its role as the mere collation and dissemination of the ideas of others, and those where the team went beyond this to embrace a creative, managerial and editorial function. Second, there grew up a cult for local, rather than nation-wide, collaborative networks. Both these developments, in retrospect, suggest certain serious weaknesses in the social interaction model when taken on its own.

The first defect lies in the assumption that all teachers share sufficient of the characteristics of those who are most energetic and creative: that, in effect, they are prepared to make the considerable sacrific of time and effort which is needed

to develop a coherent programme from a set of stimulating suggestions. Those projects in which the central team was prepared to undertake a large part of this development work on behalf of the teachers have survived better than those where there was an insistence on providing more than raw materials for teachers to shape on their own. To take a case in point, the Nuffield Junior Mathematics Project has flourished at least in part because its teachers' materials are not simply a scrapbook of ideas, but a carefully designed college, based largely on examples from the field, but extending beyond them to provide a coherent set of resources which teachers can either use largely as they stand or modify as they wish. Similarly, the recently-published Nuffield Secondary Science materials provide teachers with the scope to work out a variety of alternative patterns, but back each of these with an ample supply of teachers' guides and pupils' activity packs on various topics. In other words, the programmes which depart from the purer form of the social interaction model to incorporate some features of the research, development and diffusion model seem to run less risk of drying up when the central co-ordinating team is no longer able to provide a constant source of irrigation.

The second difficulty inherent in the social interaction model is related to the first. Lines of communication are difficult to create and even more difficult to keep open, particularly if they are widely ex ended. To some degree, the products which result from research, development and diffusion are themselves an artificial means of communication—not as efficient, we can now see, as their originators at first hoped, but at least better than nothing. In the absence of such products to perpetuate its life, an innovation based on social interaction can soon disappear without trace, or survive only in a few odd and isolated mutations. Consider, for instance, the team teaching movement in secondary schools or the introduction of the integrated day in primary schools. If you were now to look at a dozen examples of schools claiming to have adopted either of these innovations, you would be able to distinguish at least four or five totally different patterns, which had nothing in common with one another, or with the original from which they claimed to derive, except the use of the same descriptive label. An innovation based on social interaction seems to have an inevitable tendency to splinter into small fragments, each related to a compact and localised communication network. Such a network, because it does not need the same degree of careful management and maintenance as an extended, national one, is more readily able to survive on its own.

Let me give a further illustration of this process of fragmentation, and examine some of its consequences. The mid-1960's saw an explosive growth of local and regional teachers' centres associated with innovations relying mainly on social interaction. Many of these local centres soon, however, discarded their original function as nodal points in a national network of communication, and began to assume an independent existence. Others were created with a specifically local flavour at the outset. The most ambitious was the North-West Regional Curriculum Project, supported partly from local resources and partly by the Schools Council: but soon every LEA wanting to seem in the van of progress felt constrained to set up a centre of some kind serving its own area. The blessing has been a mixed one. On the credit side, teachers' centres have stimulated a good deal of local initiative, and have provided links between institutions which were previously sadly ignorant of each others' activities. Where a centre has been based on a College of Education, or where staff from the local university have become involved, it has helped to throw a few homemade bridges across the chasm dividing secondary from higher education; where it has provided a meeting ground for the staffs of neighbouring primary and secondary schools, it has at last begun to make possible some continuity of educational policy between the two. But on the debit side, the mushrooming of teachers' centres has resulted in a good deal of needless and expensive duplication of effort, and has usually produced work of noticeably lower quality than that which results from a nation-wide scheme drawing on the whole pool of national talent.

Moreover, there is now a good deal of evidence that locally-based innovations are sometimes seen by their prospective clients as more, rather than less, potentially threatening than nationally-based ones. Except for the relatively few teachers in any area who are directly involved, the products are just as "external" as those developed by a central project team; but because, in theory, any teacher in the area *could* have participated in the development work (as we *could* all of us participate in local government), the results are in an insidious way less

easy to dismiss. A kind of schizophrenia may be built up in which teachers feel trapped by the democratic apparatus of locally-based innovation, but resent it and ultimately reject it nonetheless. Innovation within the individual school is, of course, a quite different matter from that within the local or regional centre, since every teacher concerned really can play his or her own direct part in it. School-based innovation is, however, a distinct theme for discussion: I do not want to go into it here, beyond remarking that, in spite of its important advantages, the problems of quality and economy of effort are likely to be even greater than those for inter-institutional innovation on a local or regional basis.

Given the difficulties inherent in both the social interaction and the research, development and diffusion models, my guess is that in the 1970's more attention than before is likely to be paid to the third member of Havelock's triads, the problem-solving model. Its main implication is that the needs of the individual client, whether this be a whole authority, a single institution, a department within that institution, a particular teacher, a group of sudents, or even one student on his own—the needs of any one of these, according to circumstances, are seen as the point of departure. In becoming increasingly concerned with problem-solving strategies, innovation in education (as in other fields) will begin to move from product orientation to market orientation. On the pattern of the new-style enterprises discussed in Donald Schon's recent Reith Lectures, innovative agencies will increasingly see themselves as providing a specific set of services rather than as pushing a particular set of solutions.

Before discussing the implications of this change, let me give two brief examples by way of illustration. The National Council for Educational Technology has until recently concerned itself with projects modelled on the pattern of research, development and diffusion, or social interaction, or a combination of the two. It has, however, recently sponsored a feasibility study for a major development programme in colleges of education. The study team, in a most interesting and wide-ranging report, has unequivocally come out in favour of a problem-solving pattern, with the central project team acting mainly as a consultancy group. The team, it is proposed, would work with individual colleges in helping them to diagnose those needs which might best be met by employing the resources of educational technology. The needs having been identified, the central team would help in the search for ways of meeting them, and would support the college staff in identifying likely solutions and adapting them to their own specific circumstances. Again, a newly formed Nuffield Group on Research and Innovation in Higher Education will begin, in the coming academic year, a programme of collaboration with individual university departments in different subject areas. It will, on invitation from interested departments, attempt to explore from a neutral standpoint the dissonances between what the staff see as their aims, how the students perceive the staffs' aims, what the students see as their own aims, and what are the actual implications of current practice. Where a major divergence of view becomes apparent, the department will itself need to decide whether or not this divergence is seriously disfunctional. Where it is, the Nuffield group will be available to help in a search for possible solutions, and will be in a position to provide modest additional resources for the implementation of the chosen solution and the subsequent monitoring of its effects.

Various consequences can be seen to follow from a problem-solving approach to educational change. The first is that it stands the research, development and diffusion model on its head. Rather than beginning with an innovation which then has somehow to be delivered to its potential customers, it begins with the customers and searches for the innovations which might best meet their needs. In this respect it is, of course, less paternalistic than its earlier counterpart: It takes much greater cognisance of the autonomy of individual clients and of the differences between their circumstances. But by the same token, it makes heavier professional demands on those clients: for the onus of taking up and implementing any innovation now falls entirely on them. To meet these demands—and, indeed, to create any possibility of adopting a problem-solving model on a significant scale—the clients themselves will need to become more sophisticated in their appraisal of their own activities and their recognition of new needs as they begin to appear. This in surn is likely to necessitate a vastly increased effort in the continuing professional development of serving teachers.

The second point to be made about the problem-solving model is that—like

any programme based on consultancy—it is heavily labour-intensive, and hence potentially extremely costly. Unless the effects can in some satisfactory way be disseminated to other clients with similar problems, each exercise in problem-solving runs the risk of becoming a one-off job, and hence being incapable of diffusion (as psycho-analysis has, to its detriment, found itself to be). Somehow, the results, if they are to be worth a substantial expenditure of money and manpower, have to be capable of just the right level of generalisation to enable them to be transferred directly from one client to another, with the new client himself being able easily to undertake the necessary amount of adaptation. It is here taht the social interaction model could perhaps usefully be invoked: for if the first client is enabled sufficiently to master the problem-solving process, he himself can assume the position of an external consultant to the second. And as the advocates of social interaction remind us, a knowledgeable, influential and satisfied customer makes the best salesman of all.

The third implication of the problem-solving model is that it is, for all its concern with the individual client's needs, often dependent on the results of previous innovative thinking. It would be economically insane, in the perpetual shortage of resources from which the educational system suffers, to think of developing an entirely tailor-made solution to eery problem. The best compromise must surely be to have available a sufficient range of off-the-peg products which can be easily and inexpensively adapted to fit the individual client. And this throws us back to the research, development and diffusion model, with one important gloss: that the innovative product must be in its essence capable of local modification. For example, if one thinks in terms of planned curriculum change, the results must be at the opposite extreme from programmed learning materials, where the final outcome is so highly engineered, polished, and evaluated that any local tinkering with the machinery is likely to throw the whole affair out of gear. The products must be more along the lines of those currently being tested by the Nuffield Resources for Learning Project, where the aim is to provide teachers with a loosely-structured set of materials which they can readily adapt to suit their own style, and which is not crucially dependent on one particular philosophy or one particular teaching method.

What, finally, can one conclude about the dissemination and implementation of educational change in terms of the three models with which I began? Each of them has its characteristic advantages and drawbacks: on which should the wise innovator pin his faith? I suspect that the answer is on all three, in a judicious mixture depending on particular circumstances. There will always, in any systematic endeavour to improve the quality of education, be a tension between the centre and the periphery. The periphery, the client system, has a variety of different needs, but lacks the resources to provide for them. If the centre, the external change agency, attempts in any general and standardised way to meet these needs, it rapidly gets out of touch with reality and alienates or confuses many of its clients in the process. But if the periphery decides to go it alone, the resulting innovations are usually on an uneconomic scale and not of the necessary quality. They also tend to be dependent on individual enthusiasm, and hence to lack staying power. The answer seems to be for the centre to develop a variety of solutions, which allow the periphery to make the final choice and leave ample scope for local adaptation. In this light, central development can be seen as providing a carrier wave on which each innovation can be locally modulated. But such a solution, to be effective, demands an educated consumer: one who can, with limited support from outside consultants, express his own autonomy and make his own intelligent decisions.

A new scheme of resource management, role structures and professional development still has to be worked out which allows this autonomy at appropriate levels in the educational system, and helps its individual constituents to cope with it. The effort to do so will, in my view, be well worth while: for an organisational climate in which responsible individuals are enabled to take their own decisions, within sensibly defined limits, is likely to be more efficient as well as more sensitive to the need for continuous improvement in the quality of education than a climate in which some hierarchical authority decides what is best for everybody. In evolving such a pattern, innovative agencies must begin to assume a consultant as well as a developmental or co-ordinating role; and clients must become actively rather than passively involved in the process of implementing change. Although, for the various reasons already explored, the client

cannot sensibly be concerned with developing every innovation for himself, he must certainly be capable of selecting and adapting to his own circumstances the innovations developed by others. And this brings us back to the need for greater professionalisation among teachers. We shall require a very much more effective system of in-service training if educational change is to be, in the future, more than a series of ad hoc adjustments at the periphery of the system, or a series of pious plans at the centre which, even if they do happen to be taken up on a sizable scale, are often seriously garbled in the process.

SHORT MEMORANDUM BY SIXTEN MARKLUND, PH. D., KUNGL SKOLOVER STYRELSEN, STOCKHOLM, SWEDEN

THREE OBSERVATIONS CONCERNING CENTRAL RESEARCH AND DEVELOPMENT WORK

1. Educational research should be expanded to include development work in the school system, information and its dissemination. This will only be possible if the problems of school are related to those of the community at large. The ends and means of the school are part of the ends and means of society. A national institution for educational research ought therefore to co-operate closely with other public institutions on matters affecting the labour market, vocational requirements, the supply of and demand for different forms of knowledge, housing policies, the health and medical services etc. Co-operation of this kind has occurred in Sweden, as has close co-operation with central trade union organizations and employers' federations.

My opinion is that a central institution of educational research may well lead to the reinforcement of single initiatives within limited sectors but that this will not be of any substantial importance unless those initiatives are co-ordinated with improvements and reforms of society.

Swedish experience has also shown quite conclusively that this work of improvement is altogether inadequate so long as it is confined to service and information. Genuine change calls for political decisions leading to democratic and administrative resolutions by the authorities concerned.

There has been considerable discussion in Sweden as to whether the central administrative body for research and development should be located *within* the Board of Education or *outside* it. The former alternative has been chosen in order to co-ordinate research with practical innovation work at local level. It is thought that the conversion of this central unit into a separate institution would be liable to isolate educational research from social development in general. Separation in itself would not enhance the competence or capacity of the unit: this requires a collective effort at political level. An institution of this kind does not improve its contribution merely by aiming at bigger and better studies. It must contribute towards the *planning* and *implementation* of what these studies show to be necessary.

This is a plan for school development in Sweden which has not merely been constructed for the purposes of theoretical discussion but has in all essentials been put into practice by central, regional and local authorities ever since 1945.

2. The second requirement for the educational system concerns the co-ordination of different forms of instruction and learning activities into a unit which is adequate from the point of view both of the psychology of learning and of school organization. Great efforts have been made in the field of educational research and development to evolve better curricula in science, reading, social science etc. Unfortunately each of these efforts has been isolated from learning and school work in general. The need now—and this is where the idea of a new national institution for research and development comes in—is above all for total solutions in which different aspects of education are co-ordinated to form an integrated whole. The curriculum development projects of the 1960s have not produced any overall solutions, hence the somewhat qualified success of this development work, taken as a whole. Further development work should aim at total solutions instead of supporting isolated projects as has been the practice hitherto. This again means that total objectives must be discussed more carefully and co-operation established between school politicians and professionals. Otherwise the establishment of a new national research institution is unlikely to accomplish more than a perpetuation of earlier, disintegrated development work.

3. The third items also concerns matters of educational co-ordination, more

particularly between pre-school, primary, secondary and tertiary education. Hitherto research and development has been founded on the premise that each of these stages is independent of the others. In future every higher stage should be planned more than hitherto according to a concerted solution and in relation to the preceding stages. This means the avoidance at all costs of exclusive requirements and specially designed lines of study where only a minority of pupils from lower schools can qualify to continue. A national institution for research and development should also provide greater opportunities for total solutions, so as to make the principle of equal opportunities a practical reality.

Differentiation and Integration

Thirty Years of School Experiments

(By Sixten Marklund)

1. From Parallel Schools to the Comprehensive School

Ever since the elementary school was established, the link between lower and higher schools has been a subject of debate. Higher (grammar) schools were firmly established long before the elementary school appeared. At first the elementary schools and higher schools ran parallel to each other. Those aiming at higher studies never attended the elementary school, and those beginning in the elementary school could not claim credit for their studies there when transferring to a higher school.

As early as the 1840s, it was suggested that the elementary school might be used as a preparatory school for higher education. In 1867 it was proposed in Parliament that higher education should follow on the six-year elementary school. Since then the debate has continued up to our own times. Not until 1950, when Parliament resolved in principle that the nine-year comprehensive school was to be established, and 1962 when the structure of the new school was agreed upon, was the problem of parallel schools solved.

In 1894 it was decided that the first three classes of the elementary school were to form the basis for higher education. The parallel system was retained for classes 4, 5 and 6. The level for transfer to higher studies was raised to the fourth class of the elementary school in 1927, when the five-year junior modern secondary school was introduced. The same year, however, a double link was created between the elementary school and the junior secondary school. To the combination 4+5 was added the combination 6+4. The latter alternative was meant for children living in rural areas, who were considered to have attended elementary schools of a standard lower than that of the urban schools and who would therefore need a longer time at school to take the junior secondary school certificate.

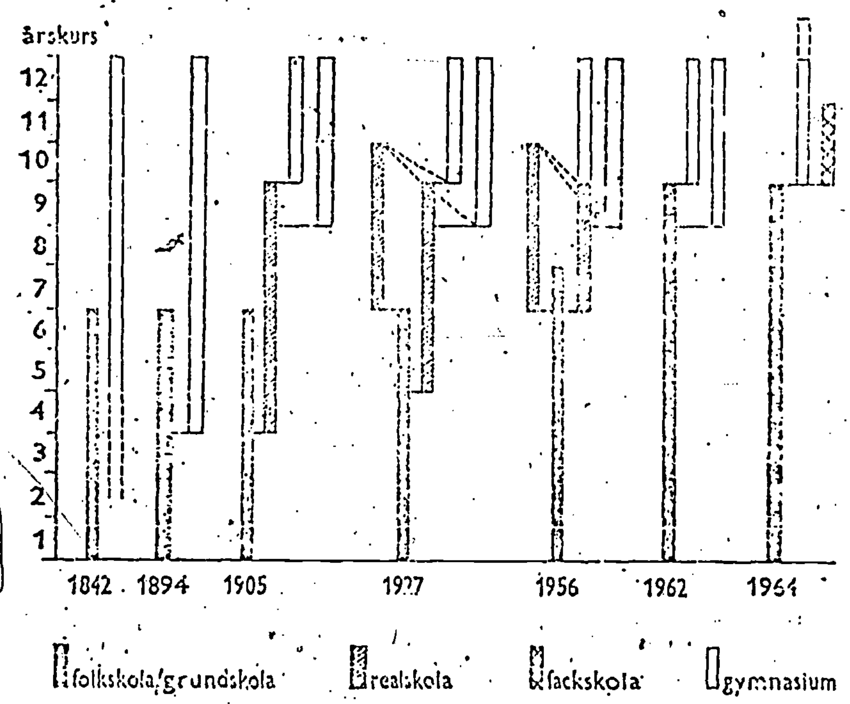
After that came the experimental work with the nine-year comprehensive school, in which linking between the undifferentiated and differentiated departments was first of the type 6+3, but in which, after the comprehensive school was finally decided upon by Parliament in 1962, linking became of the type 8+1. From 1970 all the nine-years will be fully undifferentiated.

The parallel school system, at first completely dominant, was gradually given less scope. The number of common school years at the beginning of school has increased, and the level at which organisational differentiation begins has been raised.

Linking Between Elementary and Secondary Schools

During the greater part of the nineteenth century there was no direct link between the two schools, and the attendance at a secondary school was not of fixed duration. It was not until 1894 that the secondary school was linked to the elementary school. The level of differentiation has been raised successively, and in the comprehensive school there is no streaming.

As a consequence of the general demand for longer compulsory education and the increased recruitment to voluntary education, an extensive reform of the educational system was begun in 1940, and has continued until about 1970. One is justified in speaking of a thirty-years reform. Naturally, its beginning and end are not clearly marked.



Every great change made recently in the system of education has been preceded by extensive official investigations. Some of them are given below.

	Sitting during the years	Resulted in act of Parliament in—
1940 committee of inquiry	1940-47	....
1946 school commission	1946-52	1950
1951 board of education investigation	1951-55	1958
1957 school committee	1957-61	1962
1960 secondary school committee	1960-63	1964
1960 consultative committee on teachers training	1960-65	1967
1963 committee on vocational training	1963-	1968

The Swedish committee system is probably unique, at least as far as schools and education are concerned. In no other country with comparable cultural and economic standards reforms of education seem to have been preceded by such thorough-going preparatory work as in Sweden. The educational system and the teacher training system in Sweden are strongly centralised in comparison with those of America and some Western European countries. There are few private schools in Sweden. Schools are in the hands of the local education authorities, but the cost is met largely by State grants. No serious racial, religious or linguistic problems exist. Tests used to normalise marks are the same all over the country. Teacher training, the appointment of teachers, incomes and pensions are subject to regulations which are the same for all parts of Sweden. This should be sufficient to show that the system of education is relatively homogeneous. But the conclusion must not be drawn that education is controlled completely by the central authorities. The curricula are drawn up in general terms, and can be varied at will. Thus instruction depends greatly on individual teachers and head-

masters. The reform years, 1940–70, may be divided into three periods, of about a decade each. Each began with an extensive official investigation, and these three investigations characterise the measure and debate during the period.

The 1940s may be called an investigation period, beginning with the 1940 Committee of Inquiry, which, in spite of the war and the general feeling of insecurity, took responsibility for several of the great problems of education.

The 1950s may be described as an experimental phase. The official investigation on which the work was based was the report made in 1948 by the 1946 School Commission on the future organisation of the Swedish school system. It was on the basis of this report that Parliament, in 1950, decided that experimental work was to be started on the new nine-year compulsory school.

The 1960s are a period of transition to the new system of education. This phase was begun with the 1957 School Committee, whose proposals in 1961 of a more definitive design for the nine-year school were accepted and confirmed by Parliament in 1962. After having the upper secondary education carefully investigated by a special committee during 1960–63, Parliament decided on a new "gymnasium" and a new type of two-year secondary school ("fackskola") in 1964. And according to another decision by Parliament in 1968 these two types of senior secondary schools will, together with a regularly two-year vocational education, form another new "comprehensive gymnasium". This school will start in 1961.

The Committee of Inquiry sat during the period 1940–47. Its report, comprising twenty printed volumes with a total of about 4,000 pages, is, in its thoroughness and penetrating treatment of facts, an admirable piece of work.

A new compulsory school, with wider tasks than the old elementary school had, can be discerned in the Committee's terms of reference, according to which, the ultimate aim of the school should be not only to communicate knowledge of young people, but also to educate them in the widest sense of the word.

Questions of organisation were dealt with in detail by the Committee in several reports, one of which treats of the relation between the elementary school and higher schools, and it is here that the Committee presents its first proposal for a new combined school.

This school was to comprise two stages of four years each: a lower, undifferentiated stage called the elementary school, and a higher, differentiated stage called the junior modern school. Thus the new school was to be a compulsory eight-year school.

The second school stage was to have streams leading to an examination, and streams without an examination. There were to be two examination streams, one the *theoretical junior secondary school* and the other the *technical junior secondary school*. These were to replace the general junior secondary school and the practical junior secondary school respectively. Parallel to these two streams, there was to be a general, but to a certain extent differentiated, stream without an examination, the *practical junior secondary school*. This was equivalent to the elementary school, the old continuation school, and the higher elementary school. Various differentiation alternatives were to be found in these three streams. So far as the structure of the practical junior secondary school was concerned, the Committee was prepared to give municipalities great freedom.

From the very beginning of the work of the Committee of Inquiry, it was obvious that the work of investigation would be taken over by a political commission. This commission was appointed in 1946, that is to say while the Committee of Inquiry was still sitting. The 1940 Committee's report and proposals were thus of great importance as basic material for later work, which eventually led to the establishment of the present comprehensive school. The proposed eight-year school therefore never came into being.

2. Investigations and Propositions

The 1946 School Commission, the forerunner of the experimental phase during the 1950's was in some respects a direct continuation of the Committee of Inquiry. In other respects it deviated radically from the theories and evaluations of the Committee of Inquiry. Times had changed quickly, too. The Second World War had come to an end. Germany, whose schools had long been the prototype of Swedish school organisation, was completely defeated. The old European type of organisation, with a distinct boundary between the compulsory school and the academic school was no longer the obvious model in the effort to satisfy the growing demand for school attendance and education.

In Sweden the idea of a comprehensive school was by no means a new one.

But it was not until the 1946 School Commission that the comprehensive school idea became accepted in the Swedish debate on education. The School Commission, like the Committee of Inquiry, found an extension of compulsory school attendance justified, but it raised the school-leaving age to sixteen years, not fifteen, thus introducing nine years' attendance. The definitive split between the two committees, however, was mainly in the differentiation model arrived at. The linking models proposed by the 1940 Committee, 4+4 (majority) and 6+2 (minority), were rejected. Instead, the School Commission proposed 8+1. The lower stage, classes 1 to 6, was to be common to all. In the seventh and eighth classes, most of the curriculum and timetable was to be common to all, but scope was to be allowed for organisational differentiation in the form of free choice of subjects. Streaming was not to begin until class 9 was reached.

The School Commission unlike the 1940 Committee of Inquiry, was a political committee. The Chairman was Tage Erlander, then Minister of Education. When he became Prime Minister in 1946, the chairmanship passed to Josef Weine, the new Minister. The School Commission consisted of representatives of the five parties in about the same proportion as the size of the parties, and a non-political member to represent the interests of parents. Many experts were attached to the School Commission, and were assigned to ten or so subcommittees to deal with special problems.

The concern of the School Commission was the schools investigated by the 1940 Committee of Inquiry, that is, the compulsory school and voluntary higher schools, as well as vocational training, adult education and problems of teacher training. In 1948 the School Commission published its first report, with proposals for guiding principles in the developing of the Swedish educational system, but it continued working for a few more years on, among other things, Schools of Education.

The School Commission criticised sharply the traditional Swedish school and its methods of work: the school was said to have inherited a burdensome legacy from the school of the Middle Ages and the school for civil servants and the like. The School Commission summarised the task of the school: welfare, study training, skill in languages and mathematics, general knowledge, aesthetic training, practical training, vocational guidance, health training, social training, and character training. To realise these aims, the character of the school would have to be altered: class instruction and the dominant question-and-answer method would have to be replaced by methods of work designed to permit more pupil activity and individual work.

Referring to *the content of instruction*, the School Commission proposed, that:

- instruction in Swedish should be increased;
- English should be studied from and including the fifth class;
- the so-called practical subjects should be given a stronger emphasis;
- a special subject, civics, should be devoted to the systematic study of the surrounding world throughout the whole school; and
- literature, history, geography, biology, physics and chemistry, as well as aesthetic subjects, should be given more scope.

This would need, the School Commission maintained, a compulsory, nine-year, state-supported municipal comprehensive school organised in three three-year stages: Lower Department, Middle Department and Upper Department. The top class, it was proposed, should be organized in three streams: one vocational preparatory stream (9y), one general stream (9a) and one stream leading to the senior secondary school (9g). This new school was to replace the elementary school, the old continuation school, the higher elementary school; municipal and state junior secondary schools (general and practical) and the girls' secondary school.

This proposed reform was presented to Parliament in 1950. In the special committee appointed to prepare this important matter there were differences of opinion which lead to a compromise which was later accepted by Parliament. According to this compromise, the new nine-year school was to replace the elementary school and the old continuation school, the higher elementary school and the general junior modern secondary school. Girls' schools and the practical junior secondary school were therefore excepted.

That the solution was a compromise was further stressed by the emphasis laid on the experimental work which was to precede and prepare the establishment of the new school. In the comments on the proposals preceding the 1950 Bill, teachers had expressed anxiety about the capacity of the new school to

perform its task satisfactorily. The implications of the Parliamentary decision were also discussed. The passage of the resolution on which opinions differed ran as follows:

Steps are to be taken to introduce within a period of time which—subject to what the 1950 Select Committee stated in report no. 1—is to be decided upon later, a comprehensive school based on nine years' compulsory attendance, to replace, in so far as the planned experimental work demonstrates the suitability thereof, the elementary school, continuation school, higher elementary school, municipal central school and junior modern secondary school.

Those supporting the resolution held the view that nine-year compulsory attendance was a fact, and that the experimental work referred only to the structure of the nine-year school. The opponents claimed that the introduction of the nine-year school was dependent on the results of the experimental schools. Later, in 1956 and 1957, Parliament made statements according to which the former interpretation was the correct one. Thus, the nine-year compulsory school was decided on in principle.

3. Experiments with integrated curricula

Experiments were started in the autumn of 1949, that is to say the year before Parliament arrived at a decision. In reply to a questionnaire sent out by the School Commission 144 municipalities declared their willingness to participate in the experiments. Of these, fourteen were chosen.

With these fourteen municipalities and schools in the forefront, the experimental work spread in ever widening circles. Every year new districts joined so that, at the end of the experimental period proper, the experimental schools served about half the population of Sweden. Growth became more and more rapid, as the following table shows:

School year:	*Number of pupils*
1949/50	2,483
1950/51	7,529
1951/52	14,635
1952/53	22,725
1953/54	35,784
1954/55	61,498
1955/56	84,941
1956/57	109,694
1957/58	143,370
1958/59	193,343
1959/60	268,940
1960/61	333,094
1961/62	436,595

Comparisons between experimental schools and the junior secondary school were expressed in many ways. For instance, during the second half of the 1950s it was usual for pupils in class 9g to attempt the written papers set in the junior secondary school examination. Most important, however, was that, from 1955 onwards, alternative courses were introduced in the upper departments of the experimental schools, with a so-called practical course (alternative course) and a so-called theoretical course (alternative course 2). The latter was very similar to the corresponding course in the three-year junior secondary school.

How did the new school, called the experimental school in the statutes, differ from the ordinary elementary school?

The most important innovation at the class teacher stage (middle department) was that English was introduced in classes 5 and 6 as a compulsory subject. To provide space for English, the time for the other subjects had to be redistributed. Swedish was the subject that suffered most, being reduced from ten periods a week in class 5 and nine in class 6 to six periods a week in class 5 and nine in class 6 to six periods a week in each class.

In 1951 curricular guidelines for the upper department were fixed by the National Board of Education, who was responsible for the school experiments. New guidelines were given in 1952 and 1955.

One way of ensuring stability in curricula had been to determine minimum demands for pass marks. The 1946 School Commission and the National Board of Education, however, considered such demands impossible to make without previous careful investigation. It was thought more suitable to fix *principal items*,

which were to be common to the various curricula. These principal items were to give the branches, subject matter and skills to be treated in all parallel curricula.

Specimens of how principal items might be worked out in detail were given in special curricula. Unlike the principal items, these curricula were not fixed by the National Board of Education, but were published as recommendations. It was also assumed that the curricula, like the timetables, were to be studied and revised on the basis of experience gained. The curricula were intended to encourage, among other things, a better adjustment of instruction to the aptitudes of various groups of children, and also to changes taking place in the subject matter. They were also intended to prevent teachers being bound too much by textbooks. Parallel curricula should be available, among which teachers could choose according to the level of the class taught, unless they preferred to construct curricula of their own within the given framework.

Demands were made almost immediately from more strictly defined courses. The principal items should be distributed by annual courses. The curricula were considered to be worded in too general terms. Teachers, not surprisingly, often lacked the experience that a personal planning of the contents of a course assumes. Nevertheless, the greater amount of freedom undoubtedly led to new methods of instruction in many places. But it cannot be denied that most teachers experienced this freedom as a state of uncertainty, and demanded more concrete instruction. To this the National Board of Education replied that experience should be first allowed to show in what way and how radically planning might be required.

When timetables and principal items were revised in 1955, the teachers' wishes were partly fulfilled. The distribution of subject matter by principal items and departments was retained, but in addition, suggestions were made how the principal items in some subjects, in the lower and middle departments, and all compulsory subjects, in the upper department, might be distributed by individual annual course in each department. Freedom for teacherss to plan their own work by department still remained.

It was probably the teachers in the upper department who were helped most by the proposed distribution of principal items according to annual courses. Experience of work in junior secondary schools could not always be used for guidance in the upper department, for the pupils in the experimental comprehensive schools differed so much among themselves. Some upper departments were too small, others lacked trained teachers. Many teachers in the upper department had too little experience on which to base their own planning, to which must be added what was perhaps the most serious consequence of the shortage of teachers: frequent changes of teachers.

With reference to the differentiation of courses, the School Commission had, in its report, proposed that the contents of the principal items should be divided into basic courses and higher courses. The first curricula gave only suggestions of how basic courses were to be drawn up. The idea was that the experiment should provide starting-points for such a division. The wishes expressed by teachers and headmasters for the restriction of the basic courses and higher courses led to the problem being attacked from new angles when the timetables and principal items were being revised in 1955 by the introduction of so-called alternative courses. It had been found difficult to solve satisfactorily the problem of the differentiation of courses by a division into basic and higher courses alone, for the difference between them was often only quantitative. A division into 'theoretical' and 'practical' courses had been requested very early. The National Board of Education gave in to these requests and proposed such a division of courses in English, mathematics and physics in class 7, and in these subjects and German and chemistry in classes 8 and 9. In 1959 the course in German in class 8 was divided in the same way.

The introduction of alternative courses was criticised as being a deviation from the ideas of the 1946 School Commission and a return to the junior secondary school, with organisational differentiation already after the sixth year. The alternatives were accepted generally at first, above all in large schools, but towards the end of the experimental period there was a marked tendency to abandon the alternative courses and revert to the differentiation model recommended by the School Commission.

4. Problems of differentiation and integration

Of all the problems confronting the experimental school, that of differentiation aroused most attention. When, towards the end of the experimental period,

impressions and experience came to be summed up, the adjustment between what were called internal (pedagogical) and external (organisational) differentiation was the focus of interest.

The aim of the school was that each pupil should develop his talents and interests within the framework of the school's resources. It is in, among other things, this strong stress on the *individual pupil* that the Education Committee's goals went much further than the Committee of Inquiry had intended: the *pedagogical* differentiation, often called individualisation, was to be carried as far as possible, while the *organisational* differentiation was to begin as late as possible.

In its principal report, the School Commission suggested different ways of differentiating the upper department.

In large schools it should be possible in the seventh and eighth classes to redistribute the pupils in classes according to their choice of subjects. This seems suitable in the schools where individualised instruction in heterogeneous classes cannot be adequately carried out. In schools where the number of pupils is not large enough to allow of suitable division, the pupils should be kept together in classes, but follow different lines of study in groups. In other schools, where there are enough teachers interested in individualised instruction, it should be possible to keep pupils together in the original classes, and separate them only for the optional subjects. Great freedom should be given to the local school authorities in this matter.

Two main ways of organising the upper department can be distinguished here, one with integrated seventh and eighth classes, and one with these classes differentiated by means of optional subjects. In reality, the seventh and eighth classes were streamed, which the ninth class was to be in any case, regardless of how the seventh and eighth classes were organised.

Judging by the reports sent every year by the municipalities to the National Board of Education, some attempts seem to have been made—tentative ones, it is true—to postpone the optional differentiation of pupils through optional subjects until after the seventh and eighth classes. As a rule, pupils were kept together for most lessons, and separated only for lessons with different optional subjects for the pupils. In most of the municipalities with experimental schools, however, a consistent organisational division of pupils according to choice of subject seems soon to have been established. During the school year 1954/55 the seventh and eighth experimental classes were as follows.

	Percent
Differentiated classes:	
Pupils taking two foreign languages	35.8
Pupils taking one foreign language	36.2
Pupils taking no foreign languages	6.5
Total	78.5
Integrated classes:	
Pupils taking two, one or no foreign languages	2.8
Pupils taking one or two foreign languages	10.2
Pupils taking one and no foreign languages	8.5
Total	21.5

Thus, immediately before the alternative courses were introduced, more than three-quarters of the classes were organisationally differentiated. The integrated classes often comprised the pupils "left over" after an organisational differentiation or differentiation according to choice of subjects.

The same year, 292 teachers working in the upper department were asked which type of differentiation they considered best. The replies were as follows:

Alternative replies:	Percent
Differentiation within the framework of the class	4.1
Differentiation according to pupils' ability in parallel classes	73.7
Differentiation according to previous alternative but only in certain subjects	17.1
According to other principles	2.4
No reply	2.7

The first alternative, no separation of pupils, did not attract many teachers. The majority chose the second alternative, the organisationally differentiated or streamed upper department. The third alternative, which parliament chose in 1962, was favoured by only 17.1 per cent of the teachers. In the comments made, the desire was expressed for more extensive differentiation by courses of varying degree of difficulty in the same subject, these wishes were satisfied from the school year 1955/56 by alternative courses.

The period 1951–55 was also characterised by the comparison of the upper department of the comprehensive school with the junior secondary school. The question of the quality of these two forms of school became a practical one when the first pupils in the experimental schools finished the eighth class and had to compete with those in the second-highest form of the junior secondary school for places in the four-year senior secondary school. In order to determine the comparability of the marks awarded in the two schools, tests were made to measure the knowledge of Swedish, English, German and mathematics in class 8 of the experimental school and form 4 of the five-year junior secondary school. Only experimental school pupils who had chosen two foreign languages were tested. Pupils at the junior secondary schools had consistently better results than experimental-school pupils—often the margin was so wide that the difference was statistically significant. The tests were repeated the following year, when the results in 9g were compared with those in the corresponding form of the junior secondary school. There were still differences in the same direction, but somewhat smaller.

The results of these tests gave rise to a lively debate on the merits of the experimental school *versus* the junior secondary school. On the one hand it was claimed that the tests had proved the superiority of the junior secondary school model, with early differentiation. The opposite party maintained that the supply of teachers, the pupils and the other factors were not comparable, and denied the superiority of the junior secondary school model. The great drift of theoretically inclined pupils from the experimental schools to the junior secondary school was stressed. But the most important point in the debate was how the new school was to be judged. Thus the discussion became in reality, a debate on the aims of the new school.

As reported earlier in conjunction with the principal items for the experimental school, the National Board of Education proposed in 1955 a division of alternative courses into a number of subjects. This division was made almost everywhere. The debate on differentiation changed in character. The comparisons between the experimental school and the junior secondary school became less persistent, for the establishment of alternative course 2 classes had made the upper department of the experimental school nearly the same as a junior secondary school. The choice made by pupils in the seventh and eighth classes was two-dimensional: the pupils could choose subjects *and* alternative courses in these subjects. The classes, too, were arranged according to choice of subject and course. The tendency observed earlier to allow organisational differentiation to begin in the seventh class became still more marked. The deviation from the School Commission's proposal of late differentiation was stressed further by the issue in 1957 of new marking regulations, according to which different scales of marks were to be used for alternative courses.

In many experimental schools, the upper department became almost streamed during this period. Such expressions as "two-language" and "one-language" classes, and in the eighth class also "no-language" classes, were used widely. In "two-language" classes most of the pupils had chosen alternative course 2, that is the theoretical course. In "one-language" and "no-language" classes most of the pupils took alternative course 1, that is the practical course. According to pupils' choices of course, classes 7 and 8 were organised as follows in the school year 1957/58:

Composition of class:	*Percent*
Alternative course 1 in all relevant subjects for all pupils in the class	58.0
Alternative course 2 in all relevant subjects for all pupils in the class	27.6
Alternative courses 1 and 2 respectively in different subjects for pupils in the same class	14.4

The most serious problem in the streamed upper department was that of the so-called negatively differentiated classes. Negatively differentiated classes were the classes of pupils who had chosen practically biased courses of study. It was found that the choices had not been made because of a positive interest in practical occupations, but on account of fear of failure in academic streams. It was in the consideration of these classes that the basic ideas of organisational differentiation were severely tested. Teachers found these classes difficult to manage. They lacked the incentive provided by the presence of pupils interested in study. The possibility of making a more demanding choice in isolated instances was very limited.

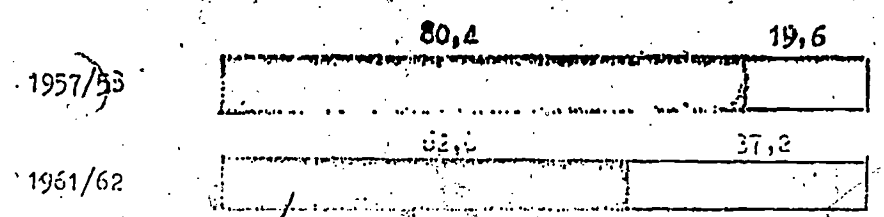
As a consequence, some experimental schools did not organise classes according to pupils' choices. This system of integrated seventh and eight classes was named the *Österåker system* after one of the pioneer experimental districts. The fact that the current regulations allowed fewer pupils in integrated classes than in classes based on pupils' choices was not without importance.

The return from a rather strictly streamed upper department to one more in line with the School Commission's proposal did not occur continuously, and a boundary drawn in 1960 is not wholly arbitrary. In 1960 the 1957 School Committee took its stand on the problem of differentiation by the so-called *Visby Agreement*. In this agreement, which was published a year before the final report of the School Committe appeared, the School Committee endorsed a differentiation model which, by and large, meant a return to the School Commission's 8+1 model, the "integrated" model. Thus the 6+3 model, the streamed model, which had dominated most of the experimental period, was rejected.

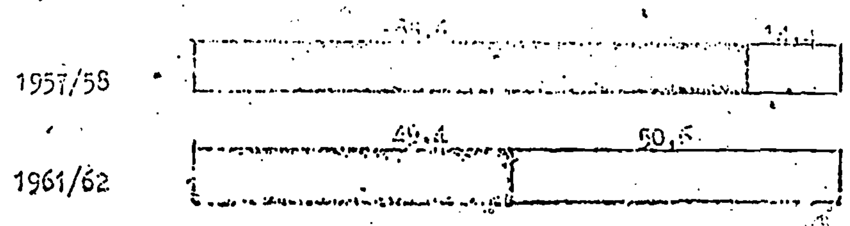
The years 1960–62 were characterised largely by the general discussion around the School Committee: first the above-mentioned Visby Agreement in 1960, and later, in 1961, the final report and the proposed comprehensive school. The discussion resolved itself into a final encounter around the problem of integrated classes and whether alternative courses were to be allowed or not. Of importance in this context was the fact that the problem of the practical junior secondary school and the municipal girls' secondary school could now be resolved. The School Committee proposed that the lines of study pursued in these types of school should be transferred to the upper department of the comprehensive school. With that, one of the cornerstones of the streamed upper department was removed.

The streamed ninth year proposed by the School Committee and later established in the comprehensive school was discussed much less.

The transition to integrated classes in the seventh and eighth years at school was, as mentioned above, clearly marked even before the 1962 decision. This is illustrated in the following figures, showing the position of differentiation in these years. The black part shows the percentage of organisational differentiation, the white the percentage of integrated classes. In both figures, one of the typical streaming years, 1957/58, is compared with the last year of the experimental period, 1961/62.



The figure shows the percentage distribution of pupils by classes in respect of their choice of *foreign languages*. The black part indicates classes in which all pupils made the same choice, usually called two-language, one-language or no-language classes. The white part represents classes in which pupils could, and did, make different choices in languages. It will be seen that the proportion of the integrated system increased from 19.6 to 37.2 per cent during the years 1957–61.



This diagram shows the percentage distribution according to choice of alternative courses. The black part represents classes in which all pupils chose either alternative course 1 only, or alternative course 2 only, and the white part classes in which pupils were able to make, and did make, "cross combinations". Here the transition to the integrated system is still clearer. By the year before Parliament's decision on a change-over to a system of integrated classes, half the classes had accepted the system in respect of division into alternative courses.

5. The Final Decision

However, the system of alternative courses introduced in 1955 was not disappearing. The decision made in 1962 regarding integrated classes only meant that the choice of alternative courses was not to determine how the pupils were to be assigned to classes. But during this final phase the whole system of alternative courses was debated. A retreat from a strict division to pedagogical differentiation was in evidence. The School Committee's report contained a compromise, according to which alternative courses could be arranged in English and mathematics. The alternative courses in German, physics and chemistry were abandoned. In German, and in French, which became an alternative to German in 1962 after having previously been the third foreign language, a distinction was made between the ordinary course and one called the "smaller course", which was to be studied quite independently and with different numbers of lessons a week. The division was abandoned completely in physics and chemistry.

The School Committee's proposal implied that the principles of differentiation approved by the 1946 School Commission were accepted, i.e. there should be no streaming in the comprehensive school until the ninth class. In the comments to the School Committee's proposal, the situation present in 1949 occurred again: most subject teachers were against the 8+1 differentiation model. In one recommendation of about 11,000 subject teachers, most of them with a university training, an organisationally differentiated upper department according to the 6+3 model was suggested. When the School Committee's proposal was debated in Parliament, the problem of differentiation did not occupy a prominent place. A large majority was in favour of integrated seventh and eighth classes and streaming in nine streams, in the ninth class. With that the problem of differentiation was solved as an organisational problem. But as a pedagogical problem it is still an urgent one.

As has been mentioned before Parliament in 1968 decided to give the nine-year Comprehensive School a new structure from the school year 1970/71. This decision does not change the principle objectives of the Comprehensive School. The proposal for the change was given by the National Board of Education, and it was based on the experiences made from the 1962 curricula.

The changes are found mainly in the upper section, i.e., grades 7–9. This section will be more "comprehensive" than earlier. The optional subjects will be more suited to the pupils' interests. Streaming in the terminal years will be abolished and the prevocational subjects will be replaced by general courses. Out of the 105 weekly periods in grades 7–9 88 periods are common to all pupils. For remaining 17 periods education will be diversified in four different elective courses according to a free choice by the pupil and his parents. These four courses are: 1) a second foreign language (German or French). 2) techniques, 3) arts and 4) economy. These courses will be for four periods in grade 7, three periods in grade 8 and four periods in grade 9.

School Research in the Swedish National Board of Education Budget Requests for 1971–72

The purpose of school research can be deduced from the evaluations current in educational policy. One central aim is increased equality. Tasks of significance to school research in this sphere are:

Balanced social composition of school classes;

Co-operation between various groups within the school, pleasure in work and pupil care:

Training of handicapped groups:

Problems of pupils with low-grade performance levels;

Problems connected with sex roles;

International material in teaching;

Methodology in adult education, plotting of factors which impede participation in and completion of adult studies; and

Pre-school activities, such as are intended to compensate for disadvantages in the individual's social and cultural background, nursery school methodology, forms of work and organization.

Educational costs have risen rapidly during the last few years. It is therefore increasingly important to draw attention to the results of invested grants. At the same time possibilities of rationalization must be reviewed. One task for school research should be to study the connection between educational costs and the results of education. The form of the regulations for state grants and discussions on programme budgeting in the sphere of education make it essential to draw attention to certain basic factors in the field of educational economics.

The results of the sacrifices made by the community in the field of education must be placed in relation to the pupils' requirements and their conditions. The question as to how well the school can look after and foster the pupils' aptitudes as well as their interests and ambitions, that is to say how effectively the aims of the school are served, cannot be answered without the aid of school research concentrated on precise definitions of school aims and the working out of methods for evaluating investigations into the fulfilment of aims referring to various pupil groups, types of locality, etc. Such an overlapping assessment of the activity of the school demands school research over a long period and in several stages in order to refine the methods of observation which will be necessary. Efforts to improve the school will not be successful until such efforts can be based on a good knowledge of the real state of affairs which it is intended to change. In any school information system, assessment data of the type suggested above will be of great importance.

THE CONTENT OF SCHOOL RESEARCH PROJECTS

Research projects can be grouped in several ways. Without respect to the basis of classifications, it is not possible to classify them into pure categories. In order to illustrate the content of the project the NBE has prepared a classification in terms of school subjects, certain aspects of teaching and various fields of investigation. The tables show the allocation of funds for 1970–71 and the amounts in accordance with the Budget Requests for 1971–72. The following comments on the budget requirements are based on these tables.

2. COMMENTS ON THE BUDGET REQUIREMENTS

2.1 School development in general—plotting studies

To this group of projects belong those which concern recruitment for adult education, a series of subordinate studies for the plotting and elucidation of educational problems affecting persons with defective vision and one study dealing with educational seek and control strategies. The last-mentioned is intended partly to investigate the extent to which a more systematic searching for problems with empirical searching methods, followed by systematic analysis of the problems, might provide experiences of value for the granting of priority for school research, partly to provide a survey and illustration of systematic aim analysis as control strategy in the sphere of education.

For projects under this heading the draft estimates for 1971-72 are 524,000 Sw Cr.

2.2 School organization and school staff, the school as an institution

Some current projects under this heading deal with social training given at school, pupil democracy and co-operation at school. Other subjects studied are the effects on the pupils of working in groups of various sizes and the classroom as a social system. School organizational problems are elucidated in those projects which study the school stage as a basis for the organization of instruction rather than the grade and in projects dealing with the pupils' choice of subjects in the continuation school and the upper secondary school. One survey study is concerned with the Swedish Lapps' wishes with regard to the organization of the school.

Several projects deal with increased efficiency of teacher training by means of aim analysis, the production of teaching materials and the qualitative assessment of teacher training. Tasks for a new project include the evaluation of the planning of days devoted to studying.

For projects in this field of school research the draft estimates amount to 3,515,000 Sw Cr.

2.3 The aims, methods, aids, and assessment of instruction

The focal point of school research lies within this field. The tables give an indication as to the school subjects and fields of instructions that are involved. Several main projects in this sector of school research are expected to be completed during the budget year.

Current projects devote attention to the aims of comprehensive school instruction with regard to the reading of literature in the comprehensive school, composition in the intermediate level and creativity, among other subjects.

Research into teaching methods forms the task of the majority of the current projects. New project plans are being drawn up to deal with the teaching of mathematics to pupils with poor performance levels and instructional methods for the teaching of English to adults.

Earlier projects based on teaching materials cover Individual Mathematics Teaching, Teaching Methods in German, Teach Yourself Material for the Instruction of the Deaf and Swedish in Special Schools for the Mentally Retarded. Fresh school research in this field is planned with regard to models for the choice of media and methods in the construction of teaching materials, typography for persons with defective vision and computer-assisted instruction.

With regard to the assessment of the results of the school, a project is being planned, among others, to develop models and methods for the assessment of instruction in a wider sense.

Some of the projects which belong to the field of instruction refer to pupils with low performance levels or handicapped pupils: those who have difficulty in learning Mathematics or experience difficulty in Reading. Those with defective hearing and Training School pupils, etc.

The draft estimates for projects concerned with the aims of teaching, methods, aids and assessment amount to 6,2446,000 Sw Cr.

2.4 The development and adjustment of the individual

Most of the school research projects previously mentioned touch directly or indirectly on the individual's development intellectually, socially, emotionally. To the above heading are referred projects with a specific approach to the subject. Several follow-up studies throw light on the individual's development from previous years, their school attendance, choice of studies and vocation, adjustment, etc. Among subjects for new projects may be mentioned the integration of the handicapped in school classes and decision-theoretical models for the paying of regard to individual differences.

For projects concerned with the development and adjustment of the individual the NBE calculates their draft estimates to be 1,175,000 Sw Cr.

2.5 Total draft estimates

Under the heading School Research the NBE calculates on draft estimates totalling 13,160,000 Sw Cr for Budget Year 1971-72. The Budget Requests for the preceding year amounted to 12,100,000 Sw Cr.

TABLE 1.—SCHOOL RESEARCH PROJECTS IN THE NBE BUDGET PROPOSAL FOR 1971-72

Institute/project	Year commenced	Year finished	Costs up to 1969-70	Granted 1970-71	Planned costs 1971-72	School research newsletter latest No.
LHG						
1. Self-instructional material for pupils with learning difficulties (SISU). Swedish, mathematics. Ages 7 to 16	1967	1973	402	270	270	1970:6
2. Systematic instruction analysis. Deals with teacher and pupil behavior, aims at formulating a more effective educational program for teacher candidates	1964	1974	495	180	325	1969:2
3. Objectives and methods for 6-year-olds. Analysis of the present nursery school program in relation to the objectives, testing of new elements and methods (2 projects are currently in progress on different aspects of this subject)	1968	1972	302	290	253	1969:3
4. Microteaching. Development of methods for analysis of, and instruction on, the effects of various teacher behavior patterns	1970	1972	17	170	244	
5. Literature reading. Ages 7 to 16. Formulation and testing of methods, instructions etc.	1969	1976	52	135	200	1970:9
6. Instructional methods in English for adults	1971				102	
LHLI						
1. Qualitative assessment of teacher training, academic subjects teachers' line	1970	1972	60		275	
2. Development of methods for study day activities, further training for teachers	1970	1973	23		130	
3. Read and write, nursery school 1970, effects of systematic individualized reading and writing training in the nursery school	1970	1974		90	263	
4. Development of certain reading, writing, and communication aptitudes 7 to 19 years	1971	1974			120	
5. Mathematics instruction for pupils with weak mathematical aptitude; pupils' needs and aptitude and instructional methodology	1971	1975			142	
LHM						
1. Individualized mathematics instruction (IMU). Ages 14 to 16. Methods system development	1963	1972	1,348	650	362	1968:12
2. Instructional methods, German. Ages 14 to 16. Method system development	1965	1973	1,554	360	491	1970:19
3. Social education, ages 7 to 16. Survey to draw up a program specially intended to train cooperation abilities, resistance to propaganda, etc.	1967	1972	519	280	385	1969:15
4. Creativity. Designing of group tests to measure independent judgment, and productive originality	1968	1972	165	180	293	1969:17
5. ITV. Drawing up models for teacher training where ITV is utilized as an educational subsystem (2 projects are currently in progress on different aspects of the subject	1963	1972	554	210	280	1970:18
6. Educational technology. Teacher training. Method system development	1968	1973	396	300	380	1968:15
7. VGL. Development of methods for checking and assessing effects in schools with various group sizes and with team teaching	1968	1973	112	145	165	
8. Public democracy. Systematic development of methods for cooperative planning, etc.	1968	1972	136	170	331	1969:16
9. Vocational training problems. To develop an overlapping theoretical model for R. & D. in vocational education	1969	1973	118	190	153	1970:23
10. Composition. Swedish, comprehensive, schools, middle department	1971	1973		95	247	1970:3
11. The integrated level school: Cooperation between kindergarten (preschool) and junior forms, individualization within the framework of the level, new groupings for the advancement of Social development	1970	74	18		200	
12. Educational development work in the region of Malmo School of Education	1971			80	156	
13. Educational seek and control strategies, systematic selection of problems for R. & D. work of the school, goal analysis as control strategy	1971	1975			24	
14. Analysis of the position of headmasters and other appointments in county colleges	1971	1974			97	
15. Training for jobs in the school sector	1971	1974			259	

TABLE 1.—SCHOOL RESEARCH PROJECTS IN THE NBE BUDGET PROPOSAL FOR 1971-72—Continued

Institute/project	Year commenced	Year finished	Costs up to 1969-70	Granted 1970-71	Planned costs 1971-72	School research newsletter latest No.
LHS						
1. ITV. See LHM No. 5	1964	1973	509	150	190	1970:29
2. The maturity process. Describe variations in the development of maturity in children from 9 to 16 years	1964	1973	124	70	160	1970:12
3. Adult education. Survey of study requirements and opportunities for adults in order to draw up effective teaching methods	1968	1973	165	100	240	
4. Forms of work in the nursery school	1968	1973	145	100	175	1970:20
5. Qualitative assessment of teacher training, class-teachers' line	1968	1974	321	230	330	1969:6
6. The Vastmanland study. Survey and analysis of the educational and vocational choices of the pupils of 1 year	1970	1974	40	100	310	1970:17
7. Typography for persons suffering from defective vision	1969	1974	15		95	
LHUm						
1. Developing better methods for setting marks and for entrance to secondary school	1964	1972	426	75	39	1970:1
2. Cooperation in schools. Development of methods for pupil participation in planning, instruction, and evaluation	1970	1974	15	80	100	
3. Elementary instruction in orientation. Method system development	1970	1974		50	97	
4. The lapps: Consulting wishes for new educational programs	1970	1972		30	43	
5. Assessment of instruction: methods for summary evaluation of effects of school activities	1970	1973			133	
6. Nursery school and 1st year, individual variations in maturity, course content, teaching methodology	1971	1975			106	
LHU						
1. SMID. Swedish (7-8-year-olds), for deaf children and those with impaired hearing. Method system development	1964	1973	734	205	270	1970:14
2. Reading training in the special school for the mentally retarded, ages 7 to 9, method system development	1965	1972	517	115	110	1970:15
3. Children with defective vision. Summary of the problems and an attempt to formulate integrated course material	1969	1973	68	170	260	1970:16
4. English in the junior stage. Method system development	1969	1975	35	150	341	1970:11
5. Computer-assisted instruction	1971				325	
PeG						
1. Civics. Ages 14 to 16. Method system development	1967	1972	340	150	81	1968:19
2. Literature reading. Ages 17 to 19. An experiment with new methods	1968	1972	70	110	117	
3. Pupil motivation. A study of pupil motivation in vocational schools	1969	1972	20	90	76	
4. MID: Models for paying regard to individual differences	1971	1975			95	
5. Models for choice of media and method in the construction of educational material	1971	1975			44	
6. Studies of the socialization process among schoolchildren	1971				111	
PeL						
1. The development of personality among pupils at special schools for the mentally retarded	1970			80	121	
PeS						
1. The classroom as a social system	1969		33		200	
PsS						
1. Adjustment, behaviour, performance. A study of pupils poorly adjusted to school in order to define improvements	1964	1976	975	220	284	1970:7

TABLE 1.—SCHOOL RESEARCH PROJECTS IN THE NBE BUDGET PROPOSAL FOR 1971-72—Continued

Institute/project	Year commenced	Year finished	Costs up to 1969-70	Granted 1970-71	Planned costs 1971-72	School research newsletter latest No.
PCS						
1. Reading training, ages 11 to 13, method system development	1970	1972		140	145	
2. The integration of handicapped pupils in the school class	1971	1974			205	
L 4:3						
1. Quantitative evaluation methods in vocational instruction: The intention is to work out tests for diagnoses in relation to objectives and the marking of vocational subjects	1969	1973	50	100	100	
2. The development of instruments to evaluate noncognitive functions	1969	1972		60	100	
3. Tests of oral production in English: Trial of various models for testing oral aptitude in English	1970	1972		70	170	
4. Instruments for measuring proficiency in foreign languages in adult education	1970	1972		70	75	
L 4:3						
Oral final tests in English for candidates for class teacher appointments	1971	1972			42	
L 4:1						
Training of R. & D. staff					550	
Planning, preinvestigation					750	
Following up of projects, information					400	
Total					13,160	

KEY TO SYMBOLS

LHG, LHLi, LHM, LHS, LHUm, and LHU=The Institutes of Education at the Schools of Education in Gothenburg, Linköping, Malmö, Stockholm, Umeå, and Uppsala.
PeG, PeL and PeS=The Institutes of Education at the Universities of Gothenburg, Lund, and Stockholm.
PsS=The Institute of Psychology, University of Stockholm.
PCS=The Educational Innovation Centre, Stockholm.
L 4:3=Test Construction Bureau, NBE.

TABLE 2.—FUNDS FOR SCHOOL RESEARCH 1970-71 AND 1971-72

[Classification according to subjects. Thousands of Sw Cr.]

School subject	Allocation of funds 1970-71	NBE budget requests 1971-72
Irrespective of subject	3,733	6,839
Several subjects	755	991
Foreign languages (several)	70	75
English	330	658
German	300	491
Swedish	890	1,502
History	140	
Social studies	150	81
Mathematics	550	494
Religious knowledge	210	
Gymnastics	95	
Vocational instruction	330	329
Total	7,553	11,460
Planning, information, training of R. & D. personnel	1,050	1,700
Total	8,603	13,160

TABLE 3.—GRANTS FOR SCHOOL RESEARCH 1970–71 AND 1971–72

[Classification by groups according to field of instruction. In thousands of Swedish crowns]

Field of instruction	Allocation of funds 1970–71	NBE budget requests 1971–72
Irrespective of stage	808	1,307
Several stages	600	1,746
Nursery school	490	797
Comprehensive school (several stages)	680	1,420
Junior stage	750	1,415
Intermediate stage	585	345
Senior stage	1,255	1,094
Upper secondary school	345	394
Vocational training	330	329
County college	60	
Adult education	410	417
Teacher training	1,240	2,196
Total	7,553	11,460
Special groups:[1]		
Physically handicapped	375	830
Intellectually handicapped	195	501
Emotionally disturbed	100	175
Low performance level		426

[1] These groups are treated also in other projects, not specific for the groups.
Note: Planning, etc., see table 2.

TABLE 4.—FUNDS FOR SCHOOL RESEARCH 1970–71 AND 1971–72

[Classification according to field of investigation. Thousands of Sw Cr.]

Field of investigation	Allocation of funds 1970–71	NBE budget requests 1971–72
School development in the main: Survey of trends and educational requirements	538	524
The school as an institution: School organization	860	1,574
School staff (teachers, heads):		
Teaching	760	1,941
1. Aims	410	740
2. Methods	2,845	3,199
3. Aids	1,170	1,687
4. Assessment	380	620
Development and adjustment of the individual	590	1,175
Total	7,553	11,460

Note: Planning, etc., see table 2.

"BACKGROUND PAPER FOR THE ILLINOIS CONFERENCE ON "NEW STYLES IN CURRICULUM DEVELOPMENT" SEPTEMBER 19–23, 1971, UNIVERSITY OF ILLINOIS

Towards Incorporating Educational Development in the Educational System. An evolving model in the German Federal Republique by Dr. Klaus Hinst. Executive Director, Center for Educational Technology, Wiesbaden, Germany.

INTRODUCTION

Educational development like any educational activity cannot happen in vacuo; it always takes place in some form of institutional frame. In fact the institutional background must be looked upon as one of the most crucial decision-points in such a development process as any decision in this respect tends to be of a more stable, conservative and permanent character than those that follow. Thus it will overshadow, facilitate, hamper or stimulate the interplay of actions that ensue.

It is with this in mind that this paper is presented to a gathering of people who discuss styles and decision issues in the field of curriculum development.

It will confine itself on the aspect of institutionalisation, and, moreover, it will concentrate mainly on one particular example, namely the Center for Educational Technology (Bildungstechnologisches Zentrum—BTZ) in the State of Hesse in West Germany, which is being established at present. Some of the information given will cast light on the peculiarities that exist in the Federal Republique generally.

Background.—Some main line of developments in the Sixties—Like many other countries Germany witnessed in the last decade the rise of education to one of the most prominent issues in public life. At least three sources can be named for this:

(*a*) the alarming reports, research results, analyses, and public discussions of prominent individuals in the field of science and education, politics and mass media;

(*b*) the publications and recommendations of commissions such as the "Bildungsrat" and the "Wissenschaftsrat" (Council for Education and Council for Science); and

(*c*) the students who already by the mere fact of causing massive unrest demonstrated that there "must be something wrong in the whole system."

Presumably it was more the first and the last which brought education into the limelight of public life, i.e. the lack of initiative from the side of the government and the political parties is noteworthy.

The official reaction to the sudden arrival of education as a public issue was in the beginning mainly concerned with providing for quantitative and structural measures to be taken. Educational planning, then becoming established within some ministries, was mainly preoccupied with the gap between educational growth and economic demand and appropriate means of bridging it. Next the structural problems of schools and universities moved into the foreground. Any educational reform in West Germany so far is characterized by the fact that educational authorities were more or less exclusively concerned with looking for structural and organizational measures to solve educational problems. While this administrative thinking still dominates educational policy and the authorities' preoccupation with educational innovation, it could be noted towards the very end of the last decade that it tended more towards qualitative aspects of education, i.e. the organization of the teaching-learning process in the classroom or elsewhere, the curricula, the goals and objectives of education and the ways and means by which they could be achieved.

Partly due to the initiative of various interested individual personalities and also of Industry, in 1969/70 serious considerations were given to the establishment of new institutions in the field of curriculum development and educational technology at the state and federal level. However, a clear co-ordination of the various similar efforts did not take place.

Though plans for the setting up of a central institute for curriculum development are being discussed at present, there is no overall strategy at the federal level. The State of Hesse has taken the intiative by inaugurating the Center for Educational Technology, North-Rhine Westfalia has founded a similar institute, and other states become increasingly interested in the idea. However the thought of establishing a network of educational development centers over West Germany with an interlinking and co-ordinating centre has not yet caught on at the federal level. In this situation the lack of a coherent plan of action at the federal level may have serious consequences in the years to come, for communication and co-operation between the state ministries of education is negligible. We are probably repeating an experience the U.S. have just gone through, since though initiated even from a central level, i.e. the U.S. Office of Education, the Regional Educational Laboratories and the R & D Centers were not interconnected through a central mother-organization. It is felt that a number of difficulties arose from this omission. These have now apparently, amongst other reasons, led to discussions about establishing some kind of national institute for educational research outside the Office of Education. This would act as a sort of backbone, in order to prevent a relatively young organism from jeopardising its own work and existence. Though it is normal to assume that other countries will profit from such an experience it is at present just as likely that West Germany might have to go through the same stages of development and repeat systematically the mistakes other countries have committed and in the meantime reversed.

THE CENTER FOR EDUCATIONAL TECHNOLOGY (BILDUNGSTECHNOLOGISCHES ZENTRUM—BTZ)

The BTZ is set up as a non-profit organization with limited liability and is presently globally financed by the State of Hesse with special funding of projects by the federal government. Negotiations are presently under-way to have the federal government as an equal partner and it is to be expected that from 1972 the Center will be legally borne as a joint enterprise by the State and the Federal Government. The mandate of the BTZ as a research and development center is to carry out—

research into the technology of learning and learning systems;

the design, prototype development, evaluation and implementation of learning systems and other learning resources;

curriculum development with special respect to innovations through the integration of new media;

an advisory function and the provision of information to other educational institutions and authorities;

where appropriate, the training and in-service-training to teachers within the realm of its other functions.

The essential organ in respect to the Center's work and the supervision of its management is a governing board consisting of representatives of the state, the city of Wiesbaden, the federal government and—with up to ⅓ of its seats—of staff representatives of the BTZ. For the conduct of its task the governing board can nominate an external research advisory committee on to which representatives from the field of research and education as well as public institutions and other relevant social organizations can be elected.

The Center's programme of work is carried out by research and project groups. Whereas the emphasis in the first group is more on long term development work or research, the project groups are primarily concerned with the development of prototypes of learning systems. For the planning, elaboration and co-ordination of the Center's activities a R & D management board is set up which consists of the research group representatives, the project leaders and elected members of the total staff.

There are six areas of work which for lack of a better terminology, will be referred to as sections, and which are named according to their (a) research orientation and (b) their school subject areas. They are:

(1) Curriculum development and instructional design;

(2) Learning Theory, Cybernetics, Computer Application and Media Systems;

(3) Social and educational psychology, Evaluation, Economy and education;

(4) Science and Mathematics;

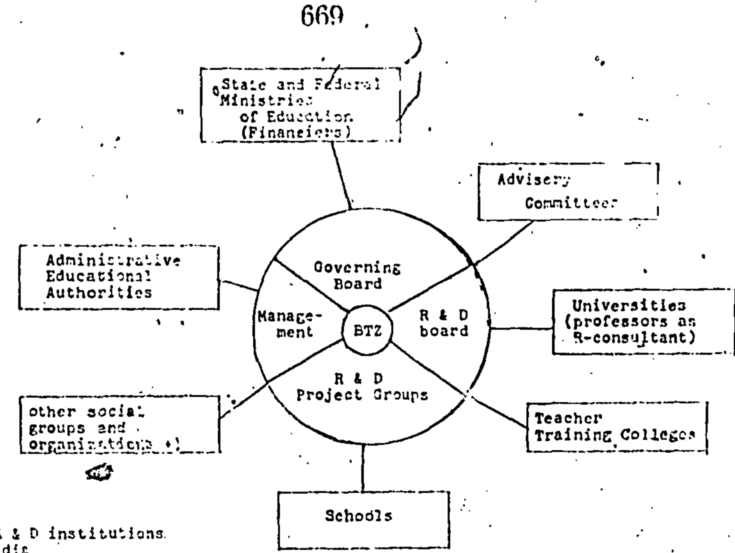
(5) Modern Languages; and

(6) Social Science and Humanities.

It is thought that the sections 4, 5 and 6 are the development oriented project groups who will be helped in their work by the research-oriented 'support troops', i. e. members of these would be seconded to the project development groups. Each working group whether more inclined towards research or to development will have a university professor as a research and scientific consultant who will advise the group in its work and also take on certain tutorial tasks. It is not intended that the professors act as group leaders although they at present are charged with the setting up of the group. Research groups will later on elect their representatives whereas project group leaders will be contractually nominated. Besides the appointment of permanent staff for the working groups it is planned to attach teachers on a secondment basis to development projects.

Thus an institutionalized linkage exists between the educational ministries of the State and the Federal Government on the one hand and between a number of universities through the contractural arrangements with consulting professors on the other, as well as the co-operation with schools through full and part-time secondments and other active forms of co-operation. The complete linkage system (established or intended) is shown in Fig. 1.

It must be noted that these institutional arrangements represent a real innovation in Germany, as to date not only are large scale development activities in education unknown but also because the BTZ is the first institution conceived of as fulfilling a middleman function between the separated worlds of politics, re-



*) e.g.
other R & D institutions
mass media
producers, and publishers
parent associations
teacher associations
students
unions etc.

FIG. 1. LINKAGE SYSTEM OF THE BTZ

search, and educational practice. As unknown as the concept is in Germany of looking at research development and implementation (RDI) as an integral whole where one has bearings upon the other, as difficult will it be to put this concept into practice. The orientation of the Center's work will be predominantly towards the pre-, primary, and secondary school level.

With respect to the topic of decision issues the basic decision making structure should be mentioned as it always has strong bearings on the actual work to be carried out by an institution (see Fig. 2).

---------- formal downward decision making structure and decision execution.

---------- formal ways through which participatory decision process is presently institutionalized.

Percentage indicates number of seats.

DECISION AREAS

1. Financing.
2. Mandate of BTZ.
3. Policy Orientation.
4. Supervision of Center's Management and Work.
5. Approval of Programme of Work.
6. General Guidelines for Dissemination and Diffusion of Center's Output.
7. Installation of R & D Project Groups.
8. Appointment of Executive Director.
9. External Relations and Formal Agreements.
10. Resource Allocation.
11. Management and Internal Co-ordination.
12. Appointment of Staff.
13. Planning and Elaboration of Programme of Work and Resources Demand.
14. Basic Principles for Planning and Carrying-out of Work.
15. Planning, Organization and Carrying-out of Work within Groups.

Three general principles guided the considerations. First, the Center's independence and freedom in its work within the constraints of the given socio-political frame had to be assured, in order to prevent the BTZ coming to serve only the interest of individual organizations and people. Secondly it had to be assured that the BTZ would work according to its mandate and not withdraw into an ivory tower of research without any impact on educational practice. Last but not

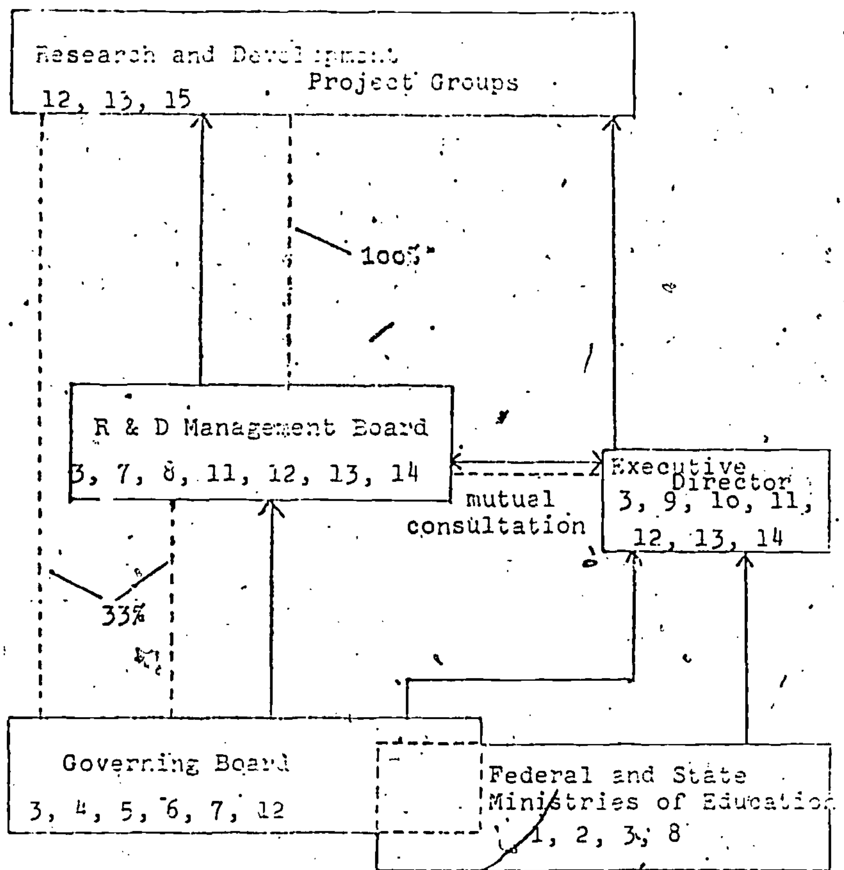


FIG. 2 PRESENT BASIC DECISION MAKING STRUCTURE

least it was essential to arrive at a system of participatory government by delegating responsibilities and involving the staff also in the essential decisions about the Center's work. Fig. 2 shows in outline how these three general principles have been realized and a few explanatory remarks might be helpful.

Representatives of the local, state and federal educational authorities together with the Center's staff (1/3 of the board's seats) will constitute the governing board which will take the basic decisions about the Center's work, such as approval of programme of work, recommendation of budgetary implications to financiers, general policy questions and the supervision of the Center's management. (The governing board may be reinforced in its work by external advisory committees which it can set up.) Because there are representatives of the ministries and of the staff on the Center's governing body, the staff can influence, through personal exchanges, decisions which ostensibly and officially are taken by the ministries alone. This is for example firmly institutionalized in the statutes of Center over appointing the executive director. Before the appointment agreement on the person of the executive director shall be achieved with the R & D management board. This means in practice that the initiative for proposing an executive director lies with the staff. As can be seen from Fig. 2 the R & D management board and the executive director share most of the responsibilities, i.e. they are more or less two equal bodies and their decisions are taken in mutual agreement, the difference being that the executive director is the official representative of the Center and legally responsible for its activities. The importance of the nature of the relationship between the R & D man-

agement board and the executive director for the functioning of the Center is obvious. In cases where agreement even after extensive discussions cannot be reached the matter can be put for decision to the governing board. This is to counteract authoritarian pressure from the side of the executive director and also to prevent the R & D management board taking decisions which will jeopardise the Center's position as a public institution and which might run against its mandate. The R & D management board is entirely made up of representatives of the research groups, the project leaders and other elected members of the staff. The Centers programme of work will be elaborated by the R & D management board, which will also lay down the general principles for its implementation. The planning, organization and carrying out of the work within the research and development project groups will be done by the groups themselves in conjunction with the Center's management and administration. The degree of responsibility to be internally delegated to the groups is at present still under discussion.

As authority with respect to school experiments, field trials, introduction of new curricula, the accreditation of learning systems, and examination requirements lies with the state ministry of education, continuous and close co-operation will be necessary.

PRESENT PROBLEMS

In what follows, we shall consider a number of problems with which the Center is faced in its initial phase and the solutions to which will certainly influence the Center's direction for the coming years. They further illuminate the context in which the Center will have to operate.

(a) The bias between educational research, educational policy and educational practice.

As was already mentioned before, the concept of R & D or, even R D I and its implications for educational work are strange notions in traditional German thinking. The philosophy of the universities which dates back to the idealistic thinking of the early 19th century has led to a strong separation between society, the universities with their emphasis on pure research, far removed from the real world, and educational practices in the schools. This historical disjunction, unacceptable in a modern society, still deeply influences present day thinking and prevents a mutually beneficial interchange between the world of science and research and the educational policy makers and executive authorities. It is not marked so much in the field of natural sciences and economics, but still prevails in social sciences, education and the humanities. The fact that it is rooted in and touches on basic social value concepts puts an educational RDI-center in a situation where it has to face scepticism and resentment from all sides, and to establish itself it has to change attitudes and overcome prejudices in those for whose benefit it works.

(b) The integration of research, development and implementation within one institution.

It is difficult to draw a line between research on the one hand and development and implementation on the other. It is likewise difficult to integrate them with equal emphasis in one organization and the practical solution is often to separate them institutionally. (See e.g. the R & R Centers and the Regional Educational Laboratories in the U.S.) However, experience shows that a separation will be disadvantageous and risky as the necessary interplay between the two sides will not take place. New structures for netting R and D and I together will have to be tried out. The BTZ has not yet settled on any particular solution but various possibilities are being conceptualized and envisaged. The linkage with a number of institutions at various universities through contractual arrangements with professors will make it possible for the Center's staff to further qualify themselves academically (academic degrees, Ph D., "Habilitation," university career etc.) The same mechanism could facilitate recruitment of new staff and, furthermore the Center can develop an acknowledge, specialized postgraduate training capacity in the years to come. To balance it in the other direction (i.e. to prevent the Center from becoming too deeply involved in basic research), its research groups would have to be understood as fluctuating groups. This means that the staff resources would be primarily allocated to development project groups, which are of an interdisciplinary nature, and only a small number of people would remain in the research groups. A shift system would allow

staff reallocation after completion of a project. In other words the research groups would be set up as part of a continuous internal in-service programme in combination with an internal "sabbatical-leave" system.

(c) *The time-lag*

It is hoped that mechanism such as the ones just mentioned will bridge the time-lag in getting up to date in methods and techniques of organizing and conducting large scale educational development work and also in basic concepts such as educational technology and curriculum development. At a time when other countries have long since departed from the gadget and hardware concept of educational technology, where the notions of systems analysis and systems development have undergone modifications to adjust them to social and educational problems, when the principles of programmed instruction are conceived of in a wider sense as development stages and guidelines rather than as a classical drill and practice procedure, when formative evaluation has replaced the summative approach in educational development work, at a time when the distinction between educational technology and curriculum development disappears rapidly—you will find that many of the old ideas are only just catching on in Germany, and that newer developments are unheard of.

At a rough estimate it will take 5 to 7 years for these more sophisticated notions to develop in Germany, if we have to repeat in a systematic way the same stages of development and the same mistakes as others. Can we not benefit from their experience and avoid this wasteful time-lag?

(d) *Personnel problems*

This raises a serious difficulty at present as there are only few people who have experience in educational R & D work. It is only now that some universities have begun to offer opportunities for students in educational science to familiarize themselves with fields such as curriculum research, learning and communication theory, evaluation procedures, informatics and systems analysis in education etc. (Educational science is a very new term in German universities which slowly replaces the old philosophically oriented concept of "pedagogy.") Moreover not only are professors and lecturers unfamiliar with problems of development work but the university tradition results in indoctrination about the purity of research which prevents the qualified student from engaging in more practical activities.

To overcome the shortage of qualified manpower the BTZ is at present developing an internal training model for its own staff. This programme includes for staff members periods of attachment of between 2–4 months at corresponding development projects in the U.S. and the U.K. in order to familiarize and update them with advanced practices. Contacts with other organizations in Germany and elsewhere, discussion seminars, workshops with outside participants who will be asked to comment on the Center's strategies and activities are likewise envisaged.

CONCLUDING REMARK

The BTZ is one of the first large scale RDI centers in Europe and represents within Germany a new model for innovating educational practice. Though it resembles the R & D Centers and the Regional Educational Laboratories in the U.S., the impulse that led to its creation seems to have come from a different direction and a number of features clearly distinguish it from them. It will be interesting to see how these different approaches develop and in which way national and international communication can be set up continuously to improve institutional arrangements, and to prevent institutional decisions impeding and laying behind developments that take place within the institutions.

RAND WORK IN EDUCATION

In recent years Rand has been doing a good deal of work on domestic public policy questions. We are currently working on a number of projects relating to education, and we have plans under way for several large-scale long-term studies. Projects are described below under the appropriate field.

A. CURRENT AND RECENT WORK

1. *Educational management and planning*

Conducting a planning effort for the proposed *National Institute of Education*, under the sponsorship of the U.S. Office of Education.

A study of the role of *educational information systems* in planning and reviewing elementary and secondary education policies, sponsored by Rand.

Collaboration with the Research Corporation of the Association of School Business Officials in conducting training sessions and developing a manual on *program planning, budgeting, and evaluation* systems in educational administration, sponsored by the Research Corporation.

Developing, under the sponsorship of the Illinois Health Education Commission, an improved basis for state *planning* techniques and analyses to help establish goals and priorities in *health manpower education*.

Developing, under the sponsorship of the California State Department of Education, (a) an analysis of expenditures by program category for representative California school districts; (b) an inventory of exemplary instructional programs, as a basis for developing comprehensive *school district cost models*, within a state-approved program budgeting system.

Collaboration with Los Angeles City Schools in designing a district-wide *information system for management, evaluation, and accountability*, sponsored by Los Angeles Unified School District; phase I of the study, to be completed in July 1971, will include development of a pilot program for representative schools in the district.

Development of *training programs in planning, programming, and budgeting* for school administrators in California, sponsored by the U.S. Office of Education.

Conducting, under the sponsorship of the President's Commission on Population Growth, a study of how new technologies and new methods of organization will affect the *demand for educational resources over the next thirty years*.

Developing, in collaboration with Los Angeles City Schools, *alternative school integration plans* for the District.

2. *Evaluation and accountability*

Analysis of successful and unsuccessful programs of *compensatory education in California*, sponsored by Rand.

Analysis of *performance contracting methods* in elementary and secondary education, sponsored by the Department of Health, Education, and Welfare. This work includes a review of past experience with incentive contracting, reviewing and monitoring of selected school districts' experience with incentive contracts, and publication of a booklet on incentive contracting for use by school authorities.

Preparation of a staff study for the California Educational Research Commission, discussing methods of experimental design, evaluation, and information system development for the *California experimental schools program*, sponsored by Rand and the Carnegie Corporation.

Evaluation of the effectiveness *of innovative compensatory education programs* in San José, California, sponsored by the San Jose Unified School District.

An analysis of the effects on *job performance of alternative technician training programs*, sponsored by the Air Force.

Evaluation of the *effects of education on the income of racial minorities*, sponsored by Rand.

3. *Analysis of educational processes*

A *longitudinal study* in one Southern California school district *of student performance* in light of student background, class size, teacher characteristics, and a number of other variables, sponsored by Rand.

A study of *data from Project Talent*, a national longitudinal sample survey of elementary and secondary school students, aimed at *determining the effects of a number of student, school, and community variables on educational achievement*, sponsored by Rand.

A study of the *state of knowledge about educational effectiveness* and its relation to educational finance, sponsored by the President's Commission on Educational Finance.

An analysis of the *appropriate student ages for offering programs of vocational education*, sponsored by the Department of Health, Education, and Welfare.

4. Educational finance

A study of *alternative school finance policies for the state of California* prepared for the Governor's Commission on Educational Reform and the Governor's Educational Task Force, sponsored by Rand and the Carnegie Corporation.

A study of *the effects of state aid* on the financial and program performance of local school districts; sponsored by The Ford Foundation.

5. Educational technology

A study of the *instructional uses of computers in higher education*, sponsored by the Carnegie Commission on Higher Education.

Development of a *computer-based model*, aimed at providing curriculum developers and teachers with information on *appropriate instructional media mix* for various instructional programs, sponsored by Rand.

B. SOME RESULTS OF CURRENT WORK

1. Educational management and planning

Completion of the preliminary plan for the proposed National Institute of Education (R-657). The plan has been submitted to the House Committee on Education and Labor, and, at the request of the Committee, Rand is collaborating with the staff during the hearings. We are continuing to work under contract with the Commissioner of Education on two issues: (1) developing a R&D management system for the NIE; (2) improving the dissemination of R&D to the educational community.

Development of a model of the flow of personnel through the health manpower system in the state of Illinois, which may be generally applicable to health manpower problems in other states.

Preparation of a cost model for California school districts which allows school districts to estimate the full cost of introducing new programs (WN-7246).

Publication of a new approach to educational information systems design, aimed at meeting needs of parents, teachers, principals, and local, state, and federal administrators (P-4377).

Publication of a number of reports on the application of program budgeting to school district planning, including one study that has been adopted for use as a text on program budgeting by schools of education (RM-6116).

2. Evaluation and accountability

Publication of one report on educational performance contracting that describes the concept, the nature, and the implications of performance contracting arrangements, with their implications for educational management (R-699). Two reports to be published this year will evaluate selected performance contracting programs and present a guide to school districts seeking to introduce or consider performance contracting arrangements.

Submitted several reports on the methodology of evaluating compensatory educational programs, based on Rand work with San Jose schools. The analysis includes not only improved methods of evaluating program effectiveness, but also development of a cost model for estimating changes in costs as a function of changes in program content or organization (R-672).

3. Analysis of educational processes

Completed a longitudinal study of the determinants of student reading achievements in grades 1–3 in one Southern California school district. The analysis showed that, contrary to some implications of the Coleman report, teachers did have a significant effect on students' reading. However, teachers experience and education, which are what the schools pay for, were *not* related to students' reading achievement. Teacher verbal score showed a positive effect for children of white blue-collar workers. For middle-class children and Mexican-American children, the teacher characteristics measured in the Rand study were not significant, indicating a need for development of better measures (RM-6362).

Tested various simultaneous models of educational achievement using data from Project Talent, a national sample survey. When tested, these models, which

take account of the interaction of the various school, community, and student characteristics, indicate that teacher morale and class size have significant effects on academic achievement. Work is continuing on this project.

4. Educational finance

Developed models of the effects on local financial behavior of various formulas for state aid to local school districts (P-4385).

Proposed, at the request of the Governor's Commission on Educational Reform, a spectrum of tax and distribution policy alternatives for California school finance (R-663).

5. Educational technology

Completed a study of the instructional uses of computers in higher education, to be published as a book by McGraw-Hill for the Carnegie Commission on Higher Education. The study emphasizes the relatively limited instructional role of computers to date, and the substantial growth that is in prospect as a consequence of the development of large-scale time-sharing systems, as well as inexpensive cassettes.

Published a Rand book giving a taxonomy of communication media, which has been well received by educational planning agencies in the United States and Europe as a basis for planning instructional programs. (*A Taxonomy of Communication Media*, Educational Technology Publications, Inc., 1971). A second publication describes how to select appropriate instructional media for training courses (R-601).

C. FUTURE WORK

Our plans for future work are likely to follow along four general and related lines:

1. Educational processes

The aim of this work is twofold:

To perceive the operational effect of different elements in the educational process by comparing variations in inputs—student and teacher characteristics, class size, school plant and equipment—with variations in output as measured by academic achievement and attitudinal criteria. This work will build on current work, including recent studies by Hanushek and Coleman and Karweit, as well as studies-in-progress by Kiesling and Averch. One important goal of this work is better definitions of input and output, including improved measures of achievement and reform of educational information systems.

To analyze the effect of educational technologies on output, developing the approach taken in the Rand study of the instructional uses of computers and in other current work.

2. Educational evaluation and accountability

This work will focus on testing educational innovations, evaluating the effectiveness of innovative and compensatory programs (including training programs), and applying evaluating techniques to the issues of educational accountability. The basis for this work has been set by current research for San Jose schools and the state of California, and a shorter study prepared for New York City schools. In vocational education and training, recent Rand studies sponsored by OEO attempt to establish systematic bases for choice among programs.

3. Educational management

The work on educational process, emphasizing improved measurement and better information systems for management and research, has a strong management orientation, as does much of the evaluation work, which stresses its role in the program development cycle. More generally, the educational management work will focus on efficient resource use, improved information systems, promotion of school integration, and identification of effective educational programs and of incentives to introduce them. Rand now collaborates with the U.S. Office of Education, (planning for the National Institute of Education), U.S. Department of Health, Education, and Welfare (incentive contracting study), state of California (planning for experimental schools and analysis of problems

of information system design), and San Jose and Los Angeles Unified School Districts (compensatory education, information system design, and integration planning), and will continue to work with all levels of educational management.

4. Educational finance

The present system, based heavily on local property taxes, is usually inequitable and increasingly inadequate. Rand plans further studies based on the work now being completed for The Ford Foundation and for the California Governor's Commission on Educational Reform. It will focus on incentives to efficient and adequate financing of local schools.

In general, we plan to carry out the proposed work in close collaboration with school districts and state school authorities. Our focus is on problem solving—improving the effectiveness of the educational system in the achievement of some major goals: cost effectiveness, compensatory education for the disadvantaged, evaluation for feedback into the educational system.

THE RAND/HEW STUDY OF PERFORMANCE CONTRACTING

(By George R. Hall and James P. Stucker*)

The performance contracting method was first applied to the education of public school students late in 1969. The ensuing publicity has generated widespread interest in and experimentation with this technique. Payment for services on the basis of student achievement, and the involvement of private, profit-oriented firms in classroom activities, have made performance contracting one of the most discussed and most controversial innovations in American education.

In simplistic terms, an educational performance contract is an agreement between a school district and an agent under which the payment by the district is based on some measure of the agent's performance. The current application of this method is typified by a local educational agency (LEA) contracting with a learning systems contractor (LSC) for the education of a selected group of students, with the contract payment determined by the measured achievement of the students. In most programs achievement is defined as the difference between the results of two tests: a norm-referenced test administered at the start of the program and another form of the test at its completion.

We would like to emphasize three points about the current performance contracting movement. First, a large number of programs are in operation, but all are experimental and most are limited in scope. Second these programs are so diverse that statements and judgments concerning one program may be completely irrelevant to the others. Third, there is great need for carefully planned and executed evaluation of these programs.

Current programs

The performance contracting movement is well under way. During the 1969–70 school year, only two school districts initiated performance contracting programs. This year there are perhaps a hundred programs; the exact number cannot be known because many programs have received very little publicity and new programs are continually being developed. The accompanying tables give some indication of the current popularity of the movement and illustrate the diversity that prevails.

We have classified the programs into four groups. The first group contains last year's programs. The second comprises the 1970–71 programs for student achievement. The third contains programs that are unique in that they are concerned with the education of teachers rather than the direct education of

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students. The final group contains the programs in the structured experiment being conducted by the U.S. Office of Economic Opportunity. This sample of programs will illustrate our fundamental points.

COMPLETED PERFORMANCE CONTRACTING PROGRAMS

Educational agency	Learning systems contractor	Subjects	Students		Maximum payment [1]
			Number	Grades	
Texarkana, U.S.A. (November 1969) [2] (1969–70 phase).	Dorsett Educational Systems.	Reading and math	300	7–12	$135,000
Portland, Oreg. (January 1970).	Audio-Visual Supply Co. (E.D.L.).	Reading	130	7–8	200
Do	5 reading teachers	do	140	7–8	[3] 1,500
Do	6 reading teachers	do	80	4–8	5,500
Subcontract with	Open Court Publishing Co.				
Portland, Oreg. (June 1970)	1 reading teacher	do	55	5–6	1,500
Do	Larrabee and Associates	do	200	4–8	500

[1] All dollar amounts are approximate.

[2] This program was conducted jointly in Arkansas-School District No. 7 and the Texas Liberty-Eylau School District. Some of the techniques of the 1969–70 phase have been turnkeyed for the 1970–71 school year.

[3] This payment is in addition to regular salaries.

Program diversity

A "performance contracting program" is simply an educational program, some portion of which is covered by a performance contract. Programs can therefore differ in a variety of ways. In the characteristics of the educational programs; in the portions of the programs under contract; in contract terms; in characteristics of the contractors; and in characteristics of the contractors' learning programs. This article can discuss only a small portion of the diversity among current programs.

A major feature common to all the programs, and one that has not been sufficiently stressed, is that each involves a remedial reading program. Many of the contracts also provide for the teaching of mathematics, but only three cover other subjects. Behavioral Research Laboratories is providing the entire curriculum for one elementary school in Gary, Indiana. The payments to BRL, however, will be based only on the students' achievements in reading and mathematics. In Jacksonville, Florida, the basic curriculum for a first grade class has been contracted for. In Dallas, Texas some vocational skills are being taught under contract.

Performance contracting for student achievement requires that the outcome of the contractor's efforts can be speciflfied and measured. At present, most educators believe that such specification and measurement are possible only in certain basic areas such as reading and math, and even for these subjects many educators are dissatisfied with the present testing instruments. The expansion of performance contracting into areas other than reading and math will partly depend on the development of norm-referenced and criterion-referenced measures of achievement in other areas.

Prices differ widely among contracts, depending mostly on how much of the educational program is contracted out. The last column in each of the tables is labeled "Target Payment" since no one knows what the actual contract payment will be until the achievement gains are measured. The figures were determined by computing the maximum amount the local education agency might have to pay the learning systems contractor; however, no comparisons among the various figures should be made, since what is included in the LSC's price differs from one program to another. For example, in some programs the contractors are simply furnishing books or materials, while in others they are responsible for the entire range of classroom resources. In some programs the teachers remain on the district payroll, while in others the contractors are responsible for teachers' salaries.

The learning systems contractors are a heterogeneous group, ranging all the way from individual English teachers to subsidiaries of some of the nation's largest corporations. Most of the contractors, however, are profit-oriented educational firms: and in most of the performance contracting programs, they are directly involved in the classroom teaching/learning process. It is interesting that they do not necessarily regard their present role as permanent. Even among the private firms, most of whom are basically developers and marketers of educational research and development, opinion differs about whether this involvement will continue in the future. Some contractors see their current involvement in classroom activities as a rapidly passing phase; soon they hope to be only consultants assisting school districts with "turnkeyed" systems, that is, learning systems originally introduced under performance contract and subsequently operated by the districts as part of their regular programs. Other contractors, however, question whether the current phase will pass so rapidly.

Curricula and teaching techniques are disparate. Most programs are based upon highly individualized instruction. How the individualized approach is implemented differs substantially, however. Some LSCs make extensive use of teaching machines. Others use no machines, or, at most, simple cassette-players. The majority are somewhere between these two extremes. Some programs emphasize extrinsic incentives, others rely exclusively on intrinsic motivation. Some stress the importance of changing the classroom environment. Some use new materials, others use only well-known materials. In short, the programs employ a wide spectrum of teaching techniques, materials, and general approaches.

The need for broad-perspective evaluations

Diverse as they are, the present programs represent only a fraction of the variety possible. This potential for almost infinite variation is the real strength of "performance contracting," and the improvement of our educational system demands that the potential be fully explored. This implies that all performance contracting programs must be evaluated from a broad perspective. Faults will be discovered in any program, but the attempt must be made to determine whether the faults are the result of that program, that contract, and that contractor, or whether, on the other hand, the faults stem from basic defects in the performance contracting concept. In our opinion, if program evaluations are thought of as simply contract evaluations—that is, if they focus merely on the amount of the achievement gain and the payment the contractor earns—much of the information obtainable from this year's experience will be lost. Every school district that is sponsoring a performance contracting program should be studying (1) the performance contracting method, (2) the particular relationships that its program has established between the district and the learning systems contractor, and (3) the composition and effectiveness of the contractor's learning system.

A broad perspective is needed for two reasons. First, a performance contracting program involves the activities not only of the learning systems contractor, but of the school district and perhaps other contractors. Perhaps the local education agency will utilize management support contractors or independent evaluators or auditors. The agency will also have to invest in facilities, and engage in planning, supervision and evaluation. The outcome not only of the contractors' activities but of other program activities should be evaluated.

Second, a broad perspective is needed because a performance contract may well generate strong effects other than its impact on student achievement. It will be likely to have affective or volitional impacts on students. The program will surely have some impacts—positive, negative, or both—on teachers and school officials. The programs may also affect school relationships with parents, taxpayers and community action groups. Evaluation of program outcomes should therefore not concentrate solely on whether the contractor met the achievement-gain goals specified in the contract, but should include the entire program and its collateral impacts.

Any views expressed in this paper are those of the authors. They should not be interpreted as reflecting the views of the RAND Corporation or the official opinion or policy of any of its governmental or private research sponsors. The work on which this article is based was performed pursuant to Contract No. HEW-OS-70-156 with the U.S. Department of Health, Education, and Welfare.

OPERATIONAL PROGRAMS FALL 1970/STUDENT ACHIEVEMENT

Educational agency	Learning system contractor	Program	Students: Number	Students: Grades	Target payment
Boston (Roxbury), Mass	Educational Solutions	Reading	400	K-6	$80,000
Colorado, State of	Dorsett Educational Systems	do	300	6-8	50,000
Cherry Creek	do	do	100	6-8	
Denver	do	do	100	6-8	
Englewood	do	do	100	6-8	
Dallax, Tex	New Century	Reading and math	875	9-12	
Do	Thiokol	Occ. skills and motiv.	875	9-12	
Flint, Mich	Dealer for E.D.L. Materials	Reading	2,160	9	210,000
Gary, Ind	Behavioral Research Laboratories.	All subjects	800	K-6	640,000
Gilroy, Calif	Westinghouse Learning	Reading and math	103	2-4	60,000
Grand Rapids, Mich	do	do	400	1-6	143,700
Do	COMES	do	600	6-9	164,000
Greenville, S.C	COMES	Reading	480	6-9	100,000
Jacksonville, Fla	Learning Research Associates	Reading, math, social studies and science.	300	1	70,000
Oakland, Calif	Education Solutions	Reading	400	6-8	80,000
Philadelphia, Pa	Behavioral Research Laboratories	do	20,000	1-2, 7-8	800,000
Providence, R.I	New Century/Communications Patterns.	do	1,500	2-8	145,000
Savannah, Ga	Learning Foundations	do	1,000		97,000
Texarkana, U.S.A	Educational Developmental Laboratories.	Reading, math and dropouts.	300	7-12	100,000
Virginia, State of	Learning Research Associates	Reading and math	2,500	1-9	212,500
Norfolk	do	do	500	4-9	
Buchanan County	do	do	500	1-7	
Dickinson County	do	do	250	1-7	
Lunenberg County	do	do	250	4-7	
Mecklenburg County	do	do	250	4-6	
Prince Edward County	do	do	250	4-6	
Wise County	do	do	500	4-9	

TEACHER ACHIEVEMENT PROGRAMS—FALL 1970

Educational agency	Number of teachers in training program	Target payment
Alachua County, Fla	40	$24,000
Orangeburg, N.Y	40	24,000
Port Jefferson, N.Y	30	18,000
Royal Oak, Mich	30	18,000
Yellow Springs, Ohio	40	24,000

Note: The contractor for all these programs is the Institute for the Development of Educational Activities.

There is also a need for dispassionate evaluations. Some people view performance contracting as the harbinger of long-awaited innovations and change in education. Others view it as a Trojan horse for forces inimical to quality education. And, of course, anyone involved in a program is likely to develop emotional attitudes and feelings about it. All these positions are understandable, but if we are to profit by this year's experience, it is important that there be objective evaluations.

Each local education agency with a program will presumably be concerned with evaluations. Many state and federal agencies are also interested in the potential of this technique and will be studying the outcomes. The OEO experiment should generate considerable information. Under the sponsorship of the U.S. Department of Health, Education and Welfare, the Rand Corporation also seeks to contribute to the evaluation of this year's performance contracting experience.

The Rand/HEW study is sponsored by the Assistant Secretary for Planning and Evaluation. It began on June 30, 1970 and will continue until November 1,

1971. A major objective of the study is the preparation of a Performance Contracting Booklet for school officials, who may be considering contracts with corporate suppliers of educational services on a guaranteed performance basis. The booklet, which will be available in November 1971, will consider the planning, contracting, managing and evaluating of performace contracting programs. Two major issues will be analyzed. The first is when and to what purposes local educational agencies might wish to engage in performance contracting programs. The second is how local educational agencies might appropriately structure their relationships with contractors. Rand is analyzing the theory and state-of-the-art of performance contracting in both noneducational and educational sectors and also performing field investigations of experience with actual performance contracting programs during the 1970–71 school year. A report on the state-of-the-art is scheduled for March 1971 and the field investigation report in September 1971.

The 1970–71 school year will provide considerable experience with performance contracting in education services. Not only are numerous programs in operation, but there is a diversity of educational approaches, student populations and other variables. It is important that this year's experience be evaluated with an eye to all the activities involved in a program and the many different impacts they might conceivably exert. HEW has contracted with The RAND Corporation to conduct one such evaluation. We hope that this and other investigations of performance contracting in education will provide some answers to the many present questions about this new and expanding educational technique.

OFFICE OF ECONOMIC OPPORTUNITY PROGRAMS, FALL 1970

Educational agency	Learning system subcontractor and program	Students: Number	Students: Grades	OEO grant[1]
Anchorage, Alaska	Quality Education Development—Reading and math	600	1-3, 7-9	$444,632
Clarke County, Ga	Plan Education Centers—Reading and math	600	1-3, 7-9	301,770
Dallas, Tex	Quality Education Development—Reading and math	600	1-3, 7-9	299,417
Duval Co., Fla	Learning Foundations—Reading and Math	600	1-3, 7-9	342,300
Fresno, Calif	Westinghouse Learning—Reading and math	600	1-3, 7-9	299,015
Grand Rapids, Mich.	Alpha Systems—Reading and math	600	1-3, 7-9	322,464
Hammond, Ind	Learning Foundations—Reading and math	600	1-3, 7-9	342,528
Hartford, Conn	Alpha Systems—Reading and math	600	1-3, 7-9	320,573
Las Vegas, Nev	Westinghouse Learning—Reading and math	600	1-3, 7-9	298,744
McComb, Miss	Singer/Graflex—Reading and math	600	1-3, 7-9	263,085
McNairy Co., Tenn	Plan Education Centers—Reading and math	600	1-3, 7-9	286,991
New York (Bronx), N.Y	Learning Foundations—Reading and math	600	1-3, 7-9	341,796
Philadelphia, Pa	Westinghouse Learning—Reading and math	600	1-3, 7-9	296,291
Portland, Maine	Singer/Graflex—Reading and math	600	1-3, 7-9	308,184
Rockland, Maine	Quality Education Development—Reading and math	600	1-3, 7-9	299,211
Seattle, Wash	Singer/Graflex—Reading and math	600	1-3, 7-9	343,800
Taft, Tex	Alpha Systems—Reading and math	600	1-3, 7-9	243,751
Wichita, Kan	Plan Education Centers—Reading and math	600	1-3, 7-9	294,700
Mesa, Ariz	Association of Teachers—Reading and math	600	1-3, 7-9	[2]33,976
Stockton, Calif	do	600	1-3, 7-9	[2]55,514

[1] The OEO grant includes the target payment to the subcontractor and $30,000 to $50,000 for the LEA management team.

[2] This payment is in addition to regular salaries.

A Bibliography of Selected Rand Publications

Education

Books

"A Taxonomy of Communication Media," R. Bretz (1970).

This book defines and describes the communication media, distinguishing between information and instruction and between instructional aids. A set of criteria is proposed by which communication media may be distinguished from nonmedia, one medium distinguished from another, and a single medium distinguished from multimedia. Two ways for classifying communication media are suggested: one, by differentiating between seven classes based on ways of representing information; the other, by dividing communication media into telemedia and recording media. Descriptions of 28 specific media include future developments as well as

all major available media. Intended primarily for media users and professionals, the book makes use of standard audiovisual terms and phrases wherever possible. Each term is defined when it is first used and is included in a glossary, placed at the beginning of the book. 192 pp. (Published by Educational Technology Publishers, 1970, $4.95. Available only from booksellers or the publisher.) Also published by Rand as RM-6070, September 1969. (SM)

"Teacher Shortages and Salary Schedules," J. A. Kershaw, R. N. McKean (1962).

An analysis of the relationship between teacher shortages and salary schedules in the public schools. It is shown that the problem facing the schools is not so much a shortage in the total numbers of teachers available as it is a problem of shortages of well-qualified teachers in specific subject-matter areas. What is needed is a salary schedule that recognizes the existence of the professional opportunities outside of teaching for teachers having certain subject-matter skills. A salary schedule with subject-matter pay differentials would be an effective and relatively inexpensive way of filling specific teacher shortages in the short run and of achieving, in the long run, a better balance of subject-matter specialities among teachers in training. The administrative problems attending the introduction of such a schedule are discussed, and it is concluded that they can be resolved without insuperable difficulties. 240 pp. (Published by McGraw-Hill Book Company, Inc., 1962; $5.50. Paperback edition, $2.95. Available only from booksellers or the publisher.)

Reports

R-486-RSP—"The Social Effects of Communication Technology" edited by H. Goldhamer, R. Westrum (May 1970).

This report reviews, in a nontechnical fashion, the principal technological development that underlie the communication revolution, especially the translator and the computer. A number of devices and communication subsystems that make use of these developments are described, together with the new capabilities that they permit. The principal discussion centers on possible social consequences of the communication revolution and indicates some policy questions they raise. In some cases changes are already under way. Social effects are discussed in the fields of education, political behavior, crime, economic life, governmental regulatory action, and the quality of life. There is reason for both optimism and pessimism about these various effects, but considerably more analysis, research, and social experience will be required to foresee future developments and enable steps to be taken that will increase the chances of favorable outcomes. Some guidelines are provided for research on the social effects of communication technology. 38 pp. (Author)

R-488-RC—"Measures of School Performance." J. S. Coleman, N. L. Karweit (July 1970).

Focuses on improving the reliability of standardized tests in the evaluation of schools and programs, since student scores as now used may lead to incorrect conclusions. The authors examine common inaccuracies in reporting and propose some remedies. A major weakness is the expression of scores in such relative terms as grade equivalents and percentiles, which, given the changes in the standardizing population, precludes valid comparisons over time. Until absolute measures are available for direct inferences about school performance, the authors propose indirect approaches that take account of the limitations of present data systems. They suggest, for example, reweighting test scores at later grades before averaging to make them reflect the school population at the entering grade, and using the distribution between high- and low-performing students over time as a measure of school effectiveness. They also supply a formula that will permit measuring the achievement of individual students as evidence of the equality of opportunity afforded by the school program. 46 pp. (Author)

R-601-PR—"The Selection of Appropriate Communication Media for Instruction: A Guide for Designers of Air Force Technical Training Programs," R. Bretz (February 1971).

Properly chosen communication media can present information more effectively than teachers do, and free the teacher to plan activities, diagnose learning problems, counsel students, and perform other tasks requiring human judgment and warmth. However, the influence of passive entertainment media too often causes instructional media to be used passively, overlooking the importance of learner response and interaction. Modest, inexpensive media, such as still television,

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slidefilms, and telewriting, often fill a teaching need as well or better than more complex, expensive media. Studies of training films have consistently shown them to contain surprisingly little *relevant* motion. Some professional touches can actually detract from learning. This report describes the 29 kinds of communications meida and discusses their most common applications in instruction. Simple, clearcut criteria, checklists, and flowcharts are provided to help course planners decide when media should be used and which class of media is best suited to each need. A taxonomy of communications media and a dictionary of terminology are appended. 75 pp. Ref. (MW)

R-612-ARPA—"Experimental Assessment of Delphi Procedures with Group Value Judgments," N. C. Dalkey, D. L. Rourke (February 1971).

One of a series of studies using Delphi procedures to aid decisionmakers in dealing with value judgments. Previous studies have not clearly shown that there is an appropriate population of factual questions to compare with value judgments; the variability of performance on factual questions is large, depending on the type of questions asked. With this in mind, some comparisons were made: Two groups of UCLA students were asked to generate and rate lists of value categories that they considered important to higher education and the quality of life. Analyses showed that (1) distributions were generally single-peaked and roughly bell-shaped, (2) the correlations between different groups and different rating methods were high, and (3) the number of changes and degree of convergence for value judgments (reduction in standard deviation) were comparable to similar indices for factual judgments. The experiment supported the conclusion that Delphi procedures are appropriate for processing value material as well as factual material. 58 pp. Ref. (See also RM-5888, RM-5957, RM-6115, RM-6118.) (KB)

R-637-CC/RC—"Accountability, Program Budgeting, and the California Educational Information System: A Discussion and a Proposal," J. A. Farquhar (April 1971).

It has been argued that the answer to public and political demands for a more responsive educational system lies in the practice of accountability. The future implementation of program budgeting may offer an attractive vehicle for accountability. Currently, many California school districts use the California Educational Information System (CEIS) as a primary vehicle for information storage, processing, and retrieval. Although adequate for present needs, the configuration of CEIS will be ill-suited to effectively support accountability and program budgeting. This report recommends that the Legislature create an Advisory Commission on Information Systems to define the structure and services of CEIS II, a statewide information system designed to support accountability and program budgeting. The development of CEIS II requires system definition to determine information needs, transitional mechanisms, legislative and economic framework, security and privacy issues, and functional system design to translate needs into specifications for subsequent programming and testing. 36 pp. Ref. (KB)

R-657-HEW—"National Institute of Education: Preliminary Plan for the Proposed Institute," R. E. Levien (February 1971).

Detailed report of the possible objectives, programs, organization, network of relationships, and initial activities of the NIE. As proposed, the NIE would be a separate agency within HEW, parallel to OE. NIE's functioning can best be described in terms of its four major program areas: (1) solving or alleviating the problems and achieving the objectives of American education; (2) advancing the practice of education as an art, science, and profession; (3) strengthening the scientific and technological foundations on which education rests; and (4) building a vigorous and effective educational research and development system. A small percentage of NIE's resources would be devoted to an intramural program conducted by a Center for Educational Studies. As the next step in development of the NIE, an initial planning staff and advisory council, aided by panels of consultants, should examine each of the major areas of educational R&D. They would review prior and current work, identify what needs to be done, and define desirable programs of work in each area. 214 pp. Bibliog. (KB)

R-672-SJS—"Project R-3, San Jose, Calif.: Evaluation of Results and Development of a Cost Model," M. L. Rapp, M. B. Carpenter, S. A. Haggart, S. Landa, G. C. Sumner (March 1971).

Evaluates the current R-3 program to raise reading and arithmetic achievement levels in a disadvantaged San Jose junior high school, and presents a cost

model to enable the decisionmaker to explore cost consequences of program variations as an aid to future planning. The model translates required resources into dollar costs by taking into account program components, resources, and resource costs. Students with lowest entering scores gained 8 months' achievement during the 4-month program. Students' average achievement gain in reading was 5 months; in arithmetic, 3 months. Program expansion left unchanged the original concepts of motivational activities, intensive involvement, individualized reading and arithmetic, and parental involvement. Major changes included heterogeneous grouping, a new hour of humanities instruction, reduced expenditures for R&D, increased expenditures for teachers, and fewer field trips. Suggestions for program improvement were made in the area of program coordination, student orientation, facilitation of achievement gain, and restructuring of intensive involvement. 170 pp. Ref. (SM)

Rand memoranda

RM-2190-RC—"An Economic Analysis of the Market for Scientists and Engineers," A. A. Alchian, K. J. Arrow, W. M. Capron (June 1958).

An attempt to determine whether there is now or has been in the recent past a "shortage" of scientists and engineers, and, if so, in what sense a shortage can exist. Reasons for seeking a greater supply of scientists and engineers are discussed, and four possible defects in the economic system that affect demands for scientists and engineers are considered. Arguments about the efficiency of our educational system are evaluated, and a case is made for the policy of differential pay for teachers according to the scarcity of their specialists. 125 pp.

RM-2473-FF—"Systems Analysis and Education," J. A. Kershaw, R. N. McKean (October 1959).

A study to assess the possibilities of making quantitative comparisons of educational systems (that is, comparisons of specific systems with variants in which changes and innovations are incorporated). Only elementary and secondary schools are considered. Comparisons of this type to help administrators and others choose improved education systems will soon be feasible. However, it is necessary for more work to be done toward estimating the "input-output relationships" in education. 70 pp.

RM-3009-FF—"Teacher Shortages and Salary Schedules," J. A. Kershaw, R. N. McKean (February 1962).

An analysis of the relationship between teacher shortages and salary schedules in the public schools. It is shown that the problem facing the schools is not so much a shortage in the total numbers of teachers available as it is a problem of shortages of well-qualified teachers in specific subject-matter areas. What is needed is a salary schedule that recognizes the existence of the professional opportunities outside of teaching for teachers having certain subject-matter skills. A salary schedule with subject-matter pay differentials would be an effective and relatively inexpensive way of filling specific teacher shortages in the short run and of achieving, in the long run, a better balance of subject-matter specialties among teachers in training. The administrative problems attending the introduction of such a schedule are discussed, and it is concluded that they can be resolved without insuperable difficulties. 239 pp. (Also published by McGraw-Hill Book Company, Inc., 1962, $5.50. Paperback edition, $2.95. Not available for sale from RAND.)

RM-4333-RC—"Education in the Program Budget," W. Z. Hirsch (January 1965).

This Memorandum demonstrates that government activity in the field of education can benefit from improved resource allocation through program budgeting. The study surveys the nature and scope of education in the United States, reviews the federal budget format, develops some guidelines for the identification of education programs in relation to fiscal year 1963, and considers arrangements for the effective use of program budgeting in this area. (Chapter 7 in book *Program Budgeting*, edited by D. Novick, Harvard. 1965.) 48 pp.

RM-4339-PR—"Some Aspects of the Allocation of Scientific Effort Between Teaching and Research," M. D. Intriligator, B. L. R. Smith (March 1966).

An analysis of the allocation of new scientists between teaching and research. The study uses an analytic framework built on specified policy objectives and a model for the allocation of new Ph.D.'s in science between the two areas. Some simplifying assumptions lead to a general welfare function for this aspect of a national science policy. Special cases of the general welfare function, including

minimization of the time required to attain a given scientific capability, are treated explicitly. The production of new scientists is determined in the model by a production function, dependent on teaching scientists and on time. 29 pp.

RM-5532-AID—"Planning Educational Change for the Primary Schools of Colombia: A Briefing," H. S. Dordick (May 1968).

An examination of ways in which Colombian and U.S./AID educational planners can improve resource allocation to increase the quantity and quality of education in Colombia. This Memorandum presents the findings of a 3-month pilot study that concentrated on the possible advantages of educational television for Colombia's primary school system. Three planning options were selected: (1) a minimal program, using present techniques and standards; (2) improvement of teaching quality through conventional means; (3) improvement of teaching quality through the expansion of educational television (ETV). The most effective option is ETV, coupled with the training of presently unqualified teachers in the techniques of teaching with television. Expansion of ETV would require a broader coverage and an increased number of channels, which could be added to the existing network at $10–15 million each. The investment for ETV would be lower than for the conventional-means option, and not much higher than for the minimal-program option. The critical obstacle to educational improvement is lack of qualified teachers. By 1975, the second option would require a 12,500-per-year increase in qualified teachers, whereas with ETV, only 5,000 additional teachers would have to be trained per year and the use of associate teachers would eliminate unqualified teachers. Most of the $435 million cost to provide ETV in all primary schools would be allocated to higher teacher salaries, improved school facilities, and administration. 39 pp.

RM-5645-RC/AID—"Returns to Education in Bogota, Colombia," T. P. Schultz (September 1968).

A study of the rate of return, in terms of wages, to various levels of education for men and women in Bogota. Based on data obtained from a labor force survey in Bogota in September 1965, estimates are derived for the private rate of return and for a partial social rate of return (based on an estimate of the average public cost per student at various school levels). Although the data are cross-sectional, and educational planning is concerned with the long-range view, the results do provide evidence for some rough indications of economic priorities. The study shows, for example, that whereas the rate of return to both men's and women's secondary and vocational education, and to some extent men's primary education, is high, the return to university training is unusually low. Thus, high priority should probably be given to the expansion of secondary and vocational schooling, with emphasis on achieving a more equal distribution of educational opportunity between urban and rural, rich and poor regions. On the other hand, continued expansion of higher education without rapid growth in domestic demand for high-level talent may only accelerate emigration of university graduates, already a matter of concern. 77 pp.

RM-5743-OEO—"Evaluating Federal Manpower Programs: Notes and Observation," T. K. Glennan, Jr. (September 1969).

A discussion of the use of evaluations of manpower training programs by OEO in planning and policymaking. The experience of past and present manpower programs should be a valuable source of data to guide the development and planning of future programs. The major problem to be overcome in an evaluation of program impact is finding a reference or control group with which to compare the work experiences of the program enrollees. Even if such a group is found, the results of evaluations cannot be compared because of inconsistent analytical assumptions. Suggested measures for improving the relevance and usefulness of evaluations are (1) to use longitudinal study designs, (2) to make new programs more experimental, (3) to establish analytic conventions for conducting benefit-cost studies, (4) to improve information systems at the local level, and (5) to increase cooperation between evaluators and policymakers. 55 pp. Bibliog. (CD)

RM-5746-OEO—"Appraising Selected Manpower Training Programs in the Los Angeles Area," L. P. Holliday, April 1969).

A summary of the principal theoretical and empirical findings of Rand studies for the Office of Economic Opportunity on manpower programs in the Los Angeles area with suggestions and recommendations for the design of future manpower programs. The emphasis is on the problems of devising a methodology for

evaluating manpower programs. Future evaluation efforts should seek findings related to program decisions and should develop new methodologies, data systems, and criteria for future evaluation of alternatives. One of the five data systems examined, the "Extension Zero" system, appears to have potential for supporting local decisionmaking and, if widely used, national evaluative analysis. Some of the recommendations are to conduct a longitudinal study, to seek low-cost sources of follow-up data for evaluation, to consider computer-based information systems, to focus job development on promising arms, to develop standards for cost-benefit studies, and to examine youth program goals. In addition, the study suggests two demonstration projects: a computer-based, reactive data system similar to "Extension Zero" and an experimental manpower project using the experience gained to date. 41 pp. (See RM-5739-OEO, RM-5740-OEO, RM-5741-OEO, RM-5745-OEO.) (MJP)

RM-5903-SJS—An Evaluation Design for San Jose Unified School District's Compensatory Education Program," M. L. Rapp, G. L. Brunner, E. M. Scheuer (May 1969).

A design for the evaluation of the San Jose Unified School District's compensatory education program, which serves primarily Mexican-American children. The major objective of the evaluation is to obtain adequate information for planning, designing, and implementing future programs. Data will be gathered on the effects of the current program on the academic performance and attitudes of the participants; a survey will gather additonal background information on the familial and cultural characteristics of the students in the program. Information on student achievement will be assessed by regression analysis. Data on attitude and attitude change, as determined by both school- and background-related factors, will be measured using cross-tabular analysis. Differential effects of program components and combinations of components will be sought at each grade level, in addition to assessing the overall contribution of program components to student achievement. 124 pp. Refs. (CC)

RM-6069-RC "Telecommunications in Urban Development," H. S. Dordick, L. G. Chesler, S. I. Firstman, R. Bretz (July 1969).

Ways in which television can be used to improve life in the urban ghetto. A survey, made in Los Angeles and New Orleans, indicates that the failure to communicate community information within the ghetto and between the ghetto and neighboring communities is largely responsible for the isolation of ghetto residents and for their inability to enter into the economic mainstream. Television, as a familiar and relatively trusted medium, has a great potential for communicating many types of information. This study considers the role of television in three major areas of education: preschool; elementary and secondary; and adult. The major conclusion is that one or more pilot projects should be implemented to assess the institutions required to produce and broadcast these projects, potential sources of financial support, and degree of public acceptance and use. The project would include two South Central Los Angeles communities and would provide progress on job information, educational opportunities, city hall news, and cultural events. 182 pp. Refs. Bibliog. (MJP)

RM-6116-RC—Progress Budgeting—for School District Planning: Concepts and Applications," S. A. Haggart, S. M. Barro, M. B. Carpenter, J. A. DelRossi, M. L. Rapp (November 1969).

An exploration of the applicability of the concepts and techniques of program budgeting, or PPBS, to the problems of educational planning at the school district level. Program budgeting is presented as basically a resource allocation system that stresses the setting of objectives, grouping activities into programs to meet the objectives, identifying the resources required by the programs, and measuring the effectiveness of the programs in meeting the objectives. Emphasis is on the system-analytical aspect of program budgeting rather than on the program accounting aspect. A program structure that departs from the traditional subject-oriented categories is proposed as a means of illustrating the concepts and techniques of resource analysis and cost models, of measuring effectiveness, and of evaluating alternatives. All these activities are necessary in the implementation of a successful program budgeting system. 225 pp. Bibliog. (Author)

RM-6179-RC—"Analyzing the Use of Technology to Upgrade Education in a Developing Country," M. B. Carpenter, L. G. Chesler, H. S. Dordick, S. A. Haggart (March 1970).

A pilot study to develop a methodology for educational planning. Colombia was chosen for analysis primarily because there is a relatively extensive educational television (ETV) project currently under way from which data of a type unavailable elsewhere could be obtained. The analysis considers the technology as it interrelates with the entire educational system in which it is to function, and proposes alternative means to attain similar improvements in that system. Four alernatives for improving the primary-school system and four for the secondary-school system are examined, including the use of ETV. In all of the alternatives, the major expenditures are for building up and maintaining a viable educational base—the teacher-training program, increased teacher salaries, and more and larger schools. The cost of upgrading education through the use of ETV is shown to be competitive with that of the traditional method—providing more teachers. Only half as many additional qualified teachers would be needed in a system using ETV. In the case of Colombia, it might be impossible to improve the quality of education without an effective substitute for some of the trained teachers needed. 150 pp. Ref. (RG)

RM-6180-NLM—"Applications of Advanced Technology to Undergraduate Medical Education," J. A. Farquhar, R. Bretz, A. S. Ginsberg, T. L. Lincoln, R. J. Melone, G. F. Mills (April 1970).

Discussion of the nature, benefits, and capabilities of advanced technological systems that evidence indicates can speed up medical education and boost the quality of instruction without straining the capacity of medical schools to expand or driving costs to unreasonable levels. Some key applications: (1) Instruction can be individualized and learning self-paced, especially in the pre-clinical sciences, by means of electronic video recording (EVR) and computer-assisted instruction (CAI). (2) Actual clinical experience can be supplemented by computer simulation, including simulation of rare maladies. Learning would not depend alone on random patient admissions. (3) A portable "med-file" library can enable students as well as physicians to tap a central medical information source with the latest findings. 94 pp. (TC)

RM-6204-NLM—"A Cost analysis of Minimum Distance TV Networking for Broadcasting Medical Information," J. A. DeRossi, R. S. Heiser, N. S. King (February 1970).

A cost analysis of the most economical AT&T common-carrier, land-line networks for broadcasting biomedical information to the U.S. biomedical community, via ETV, and to medical schools, via closed circuit TV. The cost estimates are based on standard AT&T rates. The "minimal weighted spanning tree" algorithm was programmed on JOSS to calculate the least-cost network. A 106-station ETV network to serve over 97% of all active U.S. physicians living in Standard Metropolitan Statistical Areas would require 12,000 miles of intercity line. The total cost per hour would be $80,000 for a 1-hour and $27,000 for a 5-hour broadcast; costs per potential viewer-hour would be 30 and 11 cents, respectively. All 97 medical schools could be served by 72 local AT&T Program Operating Centers using 10,000 miles of intercity line. To broadcast 160 hours a month to 85,000 students and staff in 97 medical schools, the cost is $6000 per school, $7 per potential viewer, and 5 cents per potential viewer-hour. 88 pp. Ref. (MW)

RM-6246-RC—"A Functional Classification System of the Visually Impaired to Replace the Legal Definition of Blindness," S. Genensky (April 1970).

The capacity of the visually impaired to perform normal tasks is the basis of a new classification system proposed to supplant the current legal definition of blindness, now based on arbitrary numerical values used to measure visual acuity and angular field. The problem: the law in effect lumps all Americans into two groups—those who can see and those who can't, thus denying essential services to some visually impaired persons and imposing needless, burdensome disciplines on others. For example, many are taught and strongly urged to read braille although they could be taught to read and write as the normally sighted do. Adoption of the new system would establish the fact that the visually impaired population is not homogeneous, and vastly reduce the number of people automatically classed as "functionally blind." Coupled with relevant, high-quality education and vocational training programs, it would enhance the financial and emotional independence of literally thousands of the visually impaired. 36 pp. (TC)

RM-6357-PR—"Mathematical Models in Education and Training," A. L. Hammond (September 1970).

A nontechnical introduction to the state of the art in modeling education systems, prepared for Rand's Air Force technical training study. Input-output models are convenient for examining voluminous data on student flows for short periods or for relatively static institutions. Manpower planning models seem least useful. Optimization and simulation models are complementary: Optimization models show resource allocation choices explicitly, yield plans and priorities, and stimulate policy-level discussion. Simulations can help in management and short-term planning if enormous quantities of data are available. A model need not be realistic if it gives useful answers, nor is there one best way to model a situation. Simple models are best at our present level of understanding the educational process. Included are a review of the literature and a selective bibliography. Mathematical details are given in an appendix. 38 pp. Ref. (MW)

RM-6362-CC/RC—"The Value of Teachers in Teaching," E. Hanushek. (December 1970).

Reading achievement of third graders in one California district in 1969 was related to pupils' individual backgrounds, classmates, previous progress, and characteristics of their first, second, and third grade teachers. Factors usually considered important proved insignificant. White children learned more from some teachers than from others, independent of sex, family status, reading level, and class makeup. Manual workers' children were more affected than others, notably by teachers' verbal facility. The others responded more to teachers' experience with their socioeconomic group. Generally, the only teacher characteristics significantly correlated with pupils' learning were verbal facility, recentness—not amount—of education, and reduced time spent on discipline—not the variables school districts usually seek. Mexican-American children's reading was unaffected by class ethnic composition and different teachers (none were Mexican-American). Only their entering reading levels seemed related to their gains, which averaged 6 months per year. 52 pp. (MW)

Papers

P-1625—"Some Economic Features of Public Education," J. C. DeHaven (April 1959).

A talk presented on March 11, 1959, to the Council of Directors and Supervisors of the Los Angeles City Board of Education. Granting the case for a minimum compulsory education for everyone and public financial support for this minimum education, the desirability of the sole operation of the school system by public entities is questioned. Public financial support of private schools and the freedom of choice of schools by students within the system could bring about an improvement in the quality and productivity of both public and private schools. This improvement could be achieved through the reinstitution of the merit and differential pay system for teachers, ensuring that the skilled, competent people would remain in the school system and that the best young people would be attracted to education as a career. 16 pp.

P-1751—"Computing and Education," F. J. Gruenberger (July 16, 1959).

A discussion of such aspects of the relation between computers and educators as (1) the role of a computing center on a university campus and (2) some conjectures as to the proper method of training computer programmers. 9 pp.

P-1886—"Decisionmaking in the Schools: An Outsider's View," J. A. Kershaw, R. N. McKean (January 1960).

An attempt to present a framework that will help school board members and administrators to cope with the many decisions with which they are constantly faced. The approach to decisionmaking is considered first. Then a numerical example is presented that illustrates this approach to decisionmaking and that shows how more nearly scientific comparisons of school policies can be made. 14 pp.

P-2199—"Four Types of Learning: A Phenomenological Analysis," N. Jordan (January 19, 1961).

A treatment of "learning" at a relatively low level of abstraction. The study focuses on learning processes immediately abstracted from the phenomena given, leaving open the more basic question of whether there is a unique process underlying all learning phenomena or not. It discusses a learning process found in the developing child, called "maturational learning," which is not found in an adult. In addition, the author considers three learning processes common to chil-

dren and adults: learning to do things, acquiring knowledge, and learning to get along with people or in groups. 28 pp.

P-2458-1—"What to do About Teacher Shortages," R. N. McKean, J. A. Kershaw (November 1961).

A suggestion that the shortages of teachers in particular fields can be alleviated if school districts adopt a new kind of salary schedule that permits higher salaries for relatively scarce skills. The authors urge that, if individual districts and the nation as a whole are to provide adequate education at acceptable costs, boards of education, school administrators, and other citizens should adopt such salary differentials, seriously weighing the potential gains against the difficulties. 15 pp.

P-2860—"Creativity and Research in the University," R. E. Bellma (January 1964).

An inquiry into factors that foster or hinder significant research in colleges and universities. It is maintained (1) that the way to train an individual to be creative in the theoretical domain is to keep the image of the real world constantly in front of him and simultaneously teach him how to abstract ideas and problems from observed phenomena; and (2) that new ideas and new results can be produced by directing graduate students of ordinary ability and intelligence into new areas containing sound problems. 19 pp.

P-2998—"The Teaching of Computing," F. J. Gruenberger (October 1964).

A discussion of the characteristics of the teaching of computing and the ways in which it significantly differs from the teaching of other subjects. 5 pp.

P-3083—"The Mathematical Content of the Business School Curriculum," D. Novick (March 1965).

A discussion of the amount of emphasis that should be placed on mathematics or quantitative analysis in the business school curriculum. 20 pp.

P-3172—"Further Comments on the Mathematical Content of the Business School Curriculum," G. H. Fisher (July 1965).

A discussion of how much the teaching of quantitative methods of analysis ought to be emphasized in the modern collegiate business school. Suggestions are given for curriculum content at both the graduate and undergraduate levels. 12 pp. (See also P-3083.)

P-3405—"A Transportation Program for Filling Idle Classrooms in Los Angeles," D. R. Fulkerson, A. L. Horelick, L. S. Shapley, D. M. Weiler (July 1966).

A city-wide transportation model designed to fill vacant seats in elementary school classrooms with pupils voluntarily bused from overcrowded schools elsewhere. Basic requirements include minimum cost and minimum distance traveled (average travel time, one way, is 20 minutes). Data, working assumptions, detailed routing (with map), and cost estimates are presented. By transporting 10% of the pupils now on short sessions, the program would provide the equivalent of 72 new classrooms at a daily cost per child of 67 cents, while alleviating de facto segregation. Prepared for presentation to the Los Angeles Board of Education by Transport-A-Child, a nonprofit educational foundation. 19 pp.

P-3495—"Giftedness and Achievement in a Special Program," D. G. Hays, M. L. Rapp (December 1966).

A comparison of SAT achievement test scores of San Diego sixth-grade pupils attending special classes for IQ 140 or higher, with the scores of gifted children in ordinary classrooms. Twice as many gifted children were found as might be expected in an average population. There were five times the normal number having an IQ 140 and up, but an unexplained paucity having IQ's of 130-139. Of the special-class students, almost one-fourth were not under eighth-grade level in any subject; this was true of only one-twentieth of the other gifted children. Clearcut differences were found in the scores of pupils from different special classes. None of the gifted were under grade level in any subject—a change from 20 years ago, when the majority of pupils having IQ's over 160 were performing below average for their grade level. 21 pp. Refs.

P-3499—"The Use of the Delphi Technique in Problems of Educational Innovations," O. Helmer (December 1966).

A description of the Delphi technique, a method for the systematic solicitation and collation of expert opinions, and its applications to educational planning. Delphi pilot experiments carried out in an Educational Innovations Seminar, UCLA, apply the Delphi technique of long-range forecasting to proposals for innovations in educational methods and budget allocations to achieve these innovations. 22 pp.

P-3908—"Adult Education Goals for Los Angeles: A Working Paper for the Los Angeles Goals Program," H. S. Dordick (March 1968).

An examination of the needs of adult education programs in Los Angeles by 1980. The total demand in the three levels of institutions—UC Extension, junior colleges, and public schools—will range from 2.0 to 2.6 million adults. The major percentage will be in the 21 to 55 age group, the group that contributes most heavily to the area's productivity and tax base. The greatly increased need for teachers, facilities, and funds is obvious and will be felt most severely at the public school level. Several Educational Television programs are described as one solution. This paper was prepared for the Technology Goals Committee of the City Planning Department of Los Angeles. 17 pp.

P-3893—"American Student Activism," S. M. Lipset (July 1968).

An exploration of the behavior patterns of student activists in the United States. Under greater strain and with less reward than any previous generation except that of the Depression, students today are motivated to act politically from: (1) tensions due to increased educational and social competition; (2) an idealism encouraged by society; (3) a prolonged sociological adolescence; (4) opportunities to study and discuss politics; (5) a more liberal faculty increasingly less concerned with undergraduate students. Mass activity is facilitated by young people's lack of commitment to jobs or the status quo, their legal treatment as adolescents, and their geographical availability for political mobilization. Most students have moderate views, but the activists' indiscriminate use of civil disobedience can undermine the rule of law. By operating within the framework of democracy, as did Senator McCarthy's supporters, students can influence government action and contribute to the strengthening of favorable candidates. 44 pp.

P-3911—"The Evaluation of Equality of Educational Opportunity," J. S. Coleman (August 1968).

A reply to a critique of the U.S. Office of Education report, "Equality of Educational Opportunity." Analysis of the effects of resource inputs on student achievement levels provides a strong basis for (1) the inference that school factors are of minor importance in raising achievement levels and (2) the argument for more radical environmental changes. The report's critics maintain that the study should not have attempted analysis of outputs; rather, it should have studied inputs carefully as a minimum requirement to further research. The author counters that the report, although a compromise, accomplished its stated objectives, and further, it redirected attention from school inputs as prima facie measures of quality to school outputs, enlarging school management concepts. As one of the first requests by Congress for research useful to social policymakers, the study yields useful experience for future social research guidelines. 43 pp.

P-3922—"A Flow Model for Higher Education," A. L. Hammond (August 1968).

A discussion of the use of a flow model for making quantitative estimates of observed trends in higher education or to analyze the effect of particular policies on dynamic relationships between groups involved in higher education. Using variables such as graduate student and postdoctoral population, the model summarizes the behavior of the higher educational system into a few parameters. As more data become available, the model can be extended for use in a wider range of groups and applications. The model's effectiveness is limited due to (1) consideration only of the constraint of number of available manpower; (2) study of the fields of science as one entity; (3) a limited scope; (4) insufficient discriminatory data. However, work represented by this type of model will facilitate research into the quality and effectiveness of education by eliminating some confusion concerning measurable variables and their dynamics. 17 pp. Refs.

P-3952—"The Effects of Improved Health on Productivity Through Education," I. Leveson, D. Ullman, G. Wassall (September 1968).

An examination of the relationships between health status and educational attainment, achievement, and absenteeism. Earlier materials on absenteeism, school dropouts, and armed forces rejectees are examined, and new data from a study of school health records and armed forces rejection are presented. Some rough, overall calculations are made of the effects of health on productivity through education, such as: (1) A minimum estimate of productivity losses through dropping out of school for health reasons is \$3 to \$4 billion for employed persons. (2) Absenteeism from school results in a loss of output of \$2 billion. Much needs to be done in this area of research, since omission of productivity

effects in estimates of the value of improved health biases our thinking about resource allocation away from medical care toward other investments. 19 pp. Refs. (MJP)

P-3984—"Some Comments on a Closed Circuit TV System for the Visually Handicapped," S. Genensky (December 1968).

Text of a presentation to the annual meeting of the American Academy of Optometry in December 1968, outlining Rand efforts to design and construct a closed circuit TV (CCTV) system to aid the visually handicapped. Defined as those with poor vision even with the aid of eyeglasses, the visually handicapped could be helped toward more productive lives by an increase in image magnification and light intensity or brightness. Rand's prototype CCTV system is simple and inexpensive, consisting mainly of a TV monitor on an adjustable shelf, a TV camera capable of rotating on a fixed horizontal axis, and a working surface to support the materials used. This system has been tested and found valuable to individuals in a wide age span for many uses. Several desirable prototype devices are yet to be designed and built, for which financial support is being solicited. 16 pp. (See also RM-5672-RC.) (EB)

P-3998—"The Tenth Rand Computing Symposium," Edited by F. J. Gruenberger (December 1968).

An edited and condensed transcript of the Tenth Annual Computer Symposium held at The Rand Corporation, 13 November 1967. Scheduling the symposium one day prior to the Fall Joint Computer Conference allows top men in the information-processing field to contribute their time and talents. This transcript, edited from the original by each of the attendees, reflects serious but unprepared thoughts on the topic, "The Teaching of Computing." The questions discussed included the people to whom computing should be taught; the grade level at which computer education should begin; the training of programmers and of teachers of computing; and the advice that should be given to high schools, junior colleges, and trade schools to help them initiate computer education programs. 114 pp. (MJP)

P-4012—"Quantifying the Demand for Education in Architecture and Planning in California," M. B. Carpenter (January 1969).

Discussion on methods used to project total enrollments in both architecture and planning to estimate future needs of graduate achitects. Total enrollments in architecture and related curricula (except for planning) have decreased since 1949 with respect to enrollments in higher education in general. Current improvements in curricula and specialization suggest that the falling trend may be checked in the next few years. Projections to 1980 reflect this possibility, by taking the percentage of the total (not full-time) enrollment in the U.S. and allocating 15 percent of this to California. With respect to planning, two methods are used to project total enrollments. The first is comparable to that used for architecture projections; the second method fits a straight line to the data on total enrollments, again assuming that California enrolls 15 percent. Conservative estimates for 1975 and 1980 respectively are 3200 and 3450 students for architecture, 480 and 590 for planning. 20 pp. Refs. (KB)

P-4031—"Program Budgeting as an Analytical Tool for School District Planning," S. A. Haggart, M. B. Carpenter (February 1969).

A discussion of planning, progamming, and budgeting, with emphasis on the system-analytical features in district planning. It is this side of program budgeting—providing operational and perhaps quantifiable objectives for each of the district programs—which is most valuable. The role of the analyst is to serve as a catalyst in the decisionmaking process, to provide the informational bridge between the identification of the problem and the delineation of potential solutions, with the choice being made by the decisionmaker responsible for policy determination. 6 pp. (MJP)

P-4032—"A Boomerang in a Peace Corps Attempt at Persuasion," G. A. Comstock (February 1969).

A study of Peace Corps effectiveness at persuasion in regard to their Educational (ETV) Project in Colombia. The experiment described involves a boomerang of the indirect sort attributable to what is interpreted as defense arousal. The situation involved an attempt to gain compliance from the teachers regarding changes in teaching practices. The conceptualization permitted the matching of appeals commonly used by the Peace Corps against a set hypothesized to be superior. The results suggest that the most obvious approach to gain-

ing compliance may not always be the best, and that verbal enthusiasms, although gratifying to the persuader, may often be accompanied by the erection of defenses which actually defeat the purposes of the persuasion. 24 pp. Refs. (MJP)

P-4038—"A Proposed Scheme for Federal Support for Education," J. E. Bruno (February 1969).

This Paper develops a linear programming model for calculating the amount of federal funds for education to be distributed to each state. Federal aid to education will probably expand into a general program of grants to support equalization of educational opportunity among the states. The proposed model is a step toward rational and systematic resource allocation. It takes into account the political, economic, and social constraints affecting federal resources and federal-state relationships and includes a correction factor which adjusts a state's educational expenditure to its fiscal ability. The prototype model may be made more complex as application in an actual situation reveals additional constraints and factors. 29 pp. Refs. (CD)

P-4039—"A Linear Programming Approach to Position-Salary Evaluation in School Personnel Administration," J. E. Bruno (February 1969).

Formulation and application of a linear programming model to a position-salary evaluation scheme for a local school district. A salary schedule is developed which (1) reflects the economic demands for the particular skill possessed by the personnel and (2) allows for equitable remuneration for individual personnel commensurate with contributions to the accomplishment of the objectives of the district. Procedures for developing a model are summarized: determination of school district objectives, identification of personnel by function (position), establishment of personnel factors (performance characteristics) and the relative importance of these factors to objectives, formulation of equations to represent positions at various levels in the salary hierarchy, and inclusion of environmental constraints. The proposed evaluation scheme might have wide application in the Air Force as well as the civilian sector. 29 pp. (KB)

P-4043—"Salary Schemes for Educational Personnel which Reflect School-District Priorities," J. E. Bruno (February 1969).

A description of the derivation of a linear programming salary evaluation model and its application to a school district salary structure. In this illustrative application, the model yields optimal solutions (salary schedules) which (1) are consistent with both the imposed hierarchical and budgetary constraints of a school district, (2) consider nine factors in the salary evaluation, and (3) maximize the school district's desired criterion of effectiveness, i.e., maximization of the highest teacher salary. The rigor and logic of the analytical techniques used can also aid in dealing with some of the political aspects of developing a salary schedule that would provide a career-oriented, experienced staff. 34 pp. Refs. (MJP)

P-4045—"A Systems Analytic Approach to the Employment Problems of Disadvantaged Youths," S. J. Carroll, A. H. Pascal (March 1969).

A discussion of the employment problems of disadvantaged youth and a description of a model of youth employment prospects. Public concern over these problems has spawned a variety of programs, ranging from compensatory education through anti-delinquency and anti-dropout, to skill training and job placement programs. Project evaluations and the cost/benefit analyses necessary for the design of effective program packages cannot be conducted until the complex, dynamic interrelationships that underlie youth behavior and opportunities, with all of the manifold feedback loops, are understood. This is a first step in this effort. The conceptual model of the youth employment situation consists of a set of simultaneous equations that predict the economic prospects for an individual on the basis of his experiences, tastes, abilities, perceptions, and opportunities. (Prepared for presentation at a NATO Cost-Benefit Analysis Symposium to be held at The Hague, July 7-11, 1969.) 25 pp. (MJP)

P-4047—"Minimizing the Spread in Per-Pupil Expenditures in School Finance Programs," J. E. Bruno (March 1969).

A report on some of the major points of a recent study on a mathematical programming approach to the allocation of state resources to local school districts. The goal is to develop a method for making state support programs more responsive to educational needs—especially in lower-income districts—while taking into account the constraints of a foundation-type support program. The linear-pro-

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gramming model described will (1) ensure the maximum utilization of resources available, (2) maximize state aid to each district, and (3) satisfy the budgetary and political constraints of the system. The illustrative results presented are for the case in which the objective function is the minimization of the percentage spread in the final total junior-college district expenditure per average daily attendance. 22 pp. Refs. (MJP)

P–4066—"Evaluation as Feedback in the Program Development Cycle," M. L. Rapp (April 1969).

A discussion of evaluation as a dynamic tool in the planning, implementing, observing, and correcting cycle in program development. In each phase of the cycle, evaluation helps to provide tentative answers to underlying questions as follows: (1) Planning: Where do we want to be at a given time in the future? (2) Implementation: How do we get there? (3) Observation: What progress are we making toward our goal? (4) Correction: How can we improve our planning, implementation, and observation? Evaluation in this sense provides for adaptability, flexibility, and self-improvement. 7 pp. (MJP)

P–4068–1—"Lifetime Earnings and Physicians' Choice of Specialty," F. A. Sloan (December 1969).

A study to determine whether lifetime earnings in various specialties influence physicians' choice of field. Although income payments to practicing physicians in certain specialties felt to be "shortage" fields may be a politically infeasible policy instrument for influencing specialty choice, increases in residents' salaries could have same appeal for legislators. The effectiveness of both policies is evaluated. Estimates of lifetime earnings differentials between specialties and general practice are presented. The income differentials do not explain why virtually all medical school graduates enter residency programs. However, choices among particular specialties may reflect interspecialty income differences. Regression equations measuring the supply response to income in several specialties are presented. The results indicate that income payments to practicing physicians and stipends to residents would have only a small effect on choice of field. The author suggests other factors that may influence specialty choice: vacancies in a particular specialty, intellectual stimulation, and prestige. 22 pp. Ref. (RG)

P–4070—"Pilot Training Study," W. E. Mooz (April 1969).

Description of some of the results of Rand's Pilot Training Study, an analysis of the USAF pilot training process in terms of costs and required resources. The study has developed two types of computer simulation models—PILOT, a decision model, and a parametric resource and cost model—to aid in broad planning for pilot training over the next 20 years. They permit analysis of individual training operations with regard to syllabi, course lengths, production capacity, resources necessary, and course costs. In addition, the pilot training process can be analyzed in terms of the factors that cause the need for pilots: policy variables relating to course size, rotation of pilots for career development, pilot loss rates, and to cross-training for several aircraft. 20 pp. (CD)

P–4075—"The Demand for Medical Education—A Study of Medical School Applicant Behavior," F. A. Sloan (April 1969).

An analysis of medical school applicants to provide government planners with policy instruments that may be used to affect production levels of the medical education system. Potential medical students are responsive to recent earnings developments in alternative occupations. Direct medical education cost increases have decreased student interest in medicine, and stipends in Ph.D. fields have lured them away. The government should reappraise its loan and scholarship policies, as well as its manpower objectives in the scientific fields in which its control can influence earnings. The public sector may stimulate demand for medical education by implementing policies, such as health insurance schemes that effect a rise in physician earnings. It is also possible that the supply of medical education has a positive impact on the demand. 40 pp. Refs. (EB)

P–4092—"Learning and the Structure of Information," D. Jamison, D. Lhamon, P. Suppes (July 1969).

A preliminary study to (1) bring together the ideas of mathematical learning theory and the concept of information structure, and (2) show the difficulty of analyzing these concepts for explicit, experimentally testable results. The theories discussed are: (1) Paired-Associate Learning; eight existing and several new theories are presented, including, for each new theory, its assumptions, basic mathematical structure, some derivations, and its relation to other theories. (2) Probability Learning; two essentially all-or-none theories and a linear theory are presented. (3) General information structures where the set of possible rein-

forcements has more than two subsets, which are equivalence classes with respect to their value to the subject. Findings indicate that the mathematical models of learning are awkward to handle with any but the simplest information structures on reinforcing effects, although a number of analytic results are obtained. 83 pp. Refs. (CC)

P-4099—"Specification of Educational Objectives for System Evaluation," R. B. Waina (May 1969).

A method for evaluating educational systems by measuring student achievement. Educational systems may be rationally evaluated only if the system objectives are properly specified. However, since educational goals are traditionally stated in terms of vague intangibles, it is virtually impossible to decide, without much greater specification, when students have achieved them. One solution is to state educational objectives in terms of observable student behavior. This approach was applied to the specification of course objectives in an undergraduate electrical engineering curriculum. A procedure was devised for developing a set of eventually specified objectives as a more precise restatement of course goals. The resulting objectives were stated clearly and concretely, so that their attainment could be objectively measured on a binary (go, no-go) scale, and the performance of individual students measured independently of the performance of other students. 22 pp. Refs. (EB)

P-4108—"Television and Ghetto Education: The Chicago Schools Approach," R. Bretz (June 1969).

An evaluation of the ITV cluster programming approach developed in Chicago, with emphasis on the usefulness of the program in providing material to the classrooms of ghetto areas. The Chicago public schools have moved toward a practical solution to the problem of improving ghetto schools through a very localized use of instructional television systems. As a direct result of ITV, staff members of participating cluster schools of Chicago report a significant improvement in both attitude and achievement of the average pupil. Moreover, teachers who have little or no experience in working with underprivideged children can benefit greatly from the in-service training received when observing techniques of more experienced television instructors. These and other aspects of cluster programming are compared with characteristics of the central production alternative in terms of cost as well as services. Suggestions are made for the urban school of the future. 17 pp. Refs. (KB)

P-4128-1—"Teaching of Policy Sciences: Design for a Doctorate University Program," Y. Dror (November 1969).

An outline of the proposed content and objectives of a curriculum for a postgraduate program in policy sciences. As envisioned, training of policy scientists on the doctorate level should involve multidimensional learning experiences—traditional lectures, readings, exercises, colloquia, and seminars. Such experiences should enable optimal understanding of three basic areas of policy science: decisionmaking and policymaking behavior, normative policy theory, and institutional change. Learning methods should include, as a minimum, gaming, cases and projects, internship, new types of dissertations, and study tours. Some experimentation with task directed T-group methods is indicated. Various activities are considered to advance policy sciences as an interdiscipline and further its academic and professional recognition. 40 pp. (KB)

P-4162—"Program Budgeting as a Way to Focus on Objectives in Education," M. B. Carpenter (September 1969).

Identification of primary objectives in program budgeting to help school districts' decisionmaking. The aim of program budgeting is to make explicit the relationship between resources (money, teachers, facilities) and results of school-district activities. The district activities are first categorized into primary objectives that (1) state goals to which all operational decisions refer, (2) tell the layman what schools are trying to do (and what they do do) (3) are stable and long-term, but not inviolable. Both lower- and higher-level objectives contribute to the primary objectives. Each primary objective is translated into the activities that support it. Desirable characteristics are multiplicity, extra-institutional orientation, comprehensiveness, breadth, specificity, staying power. Competition for resources can be handled only by analysis. 17 pp. Bibliog. (SM)

P-4174—"The Peace Corps Volunteer and Achieving Education Change with New Media," G. A. Comstock (August 1969).

A description of the Peace Corps educational television (ETV) project in Bogota, Colombia, 1964–1966. The Volunteer became the mediator between advanced technology and a developing society. Public elementary schools received

30-60 minute/week broadcasts of ETV. The project goals, now accomplished, were to introduce ETV as an educational tool, to develop televised curricula, to expand the project throughout Colombia, and to promote Colombian self-sufficiency. The Volunteers, non-teaching, served three areas: utilization, production, and installation/maintenance. The utilization Volunteers were especially valuable, dealing with problems at the point of reception, the physical capabilities of the school, the organizational hierarchy, teachers' schedules, transmission difficulties, power failures, etc. Thus placed on the scene of ETV reception, the Volunteer meant the difference between education received and an empty show. 25 pp. (SM)

P-4195—"Analysis of Educational Programs within a Program Budgeting System," M. B. Carpenter, S. A. Haggart (September 1969).

A discussion of concepts, techniques, and problems in the analysis of a program-budgeting system for the developmental program, Project R-3, of the San Jose Unified School District. Six elements of the analysis (objectives, alternatives, cost or resources used, models, criteria, and effectiveness measures) become inputs to both quantitative and qualitative analysis. Project R-3 was successful in increasing student progress in reading and math by involving them and their parents and changing their attitude set. In both reading and math the program group had gained more than the control group by the end of the school year. The analysis was made by varying three components—remedial reading and math, intensive student and parental involvement, and gaming/simulation—to produce equal-cost alternatives for planning. This kind of analysis makes subjective judgments explicit and relates them in an orderly way. 38 pp. (SM)

P-4211—"The Relationship of School Inputs to Public School Performance in New York State," H. J. Kiesling (October 1969).

Using data obtained in 1957-1959, this analysis is intended to establish an educational production function. Great multicolinearity exists between most of the school and community variables germane to the study. By factor analysis the potentially important variables could be distinguished. These form the basis for the explanatory equations in the multiregression model, which is fitted to average pupil performance in five groupings according to parent occupation for the language, arithmetic, and composite test scores. Findings show the model ineffectual for non-urban districts. The most consistently important school variable is expenditure on supervision followed by the salary variable. Both school input and socioeconomic factors were found to be highly related to performance, but surprisingly, the teacher-pupil ratio is related negatively. These findings should be regarded as suggestive for future research rather than for policy decisions. 33 pp. Bibliog. (MT)

P-4248—"Analytical Approaches and Applied Social Sciences," Y. Dror (November 1969).

The natural link between the applied social sciences and the analytical or systems approach as rational avenues to improved policymaking and better social action is explored in this paper which focuses on how that link may be forged. Results to date have been disappointing. Rather than patchwork efforts at cross disciplinary training, the author advocates establishment of "policy sciences" as a new interdiscipline. Implications in terms of institutional changes in methodology, teaching and research are outlined. 26 pp. (TC)

P-4252—"Developing a Program Budgeting System as an Aid in Planning Higher Education," S. A. Haggart (December 1969).

In order to address the fundamental question in planning higher education—what are the expenditures for higher education buying now and what should be bought in the future—the author recommends a consequence-oriented budget that provides a realistic picture of what is happening in relation to what should be happening in terms of programs. The focus is on identifying the operational objectives, developing programs necessary to meet the objectives, and evaluating alternative ways of achieving objectives. This paper describes the basic features of a PBS and includes a discussion of the problem areas encountered. The steps in acquiring PBS capability are outlined by a listing of the principal tasks involved. 13 pp. (RG)

P-4269—"The Self-Directed System: A Simplified Production Method for Instructional Television," R. Bretz (December 1969).

The author presents a self-directed method of producing instructional TV programs, in which switching and camera handling are done by the instructor himself as he is teaching. Two systems are described—one system was designed and constructed by the author as a feasibility demonstration at the U.S. Marine Corps School in Quantico, Va., and the other, GENESYS, is a system in use at

the University of Florida. The quality and costs of these self-directed productions are contrasted with conventional instructional television schemes and indicate the proposed methods compare favorably in quality and are less costly. 22 pp. (RG)

P-4273—"The Use of PPBS in a Public System of Higher Education: Is It 'Cost Effective?'" J. S. Dyer (December 1969).

A qualitative examination of the potential benefits to be derived from the use of a more logical, objective-oriented system for planning in higher education. Adherence to classical techniques of planning and budgeting which rely on ratios of efficiency, reaction to environmental factors and comparison with peers, can cloud perception of the purpose and responsibilities of an institution. The Planning-Programming-Budgeting System (PPBS) involves the identification of objectives, the organization of activities into programs to achieve those objectives, and the analysis of alternative systems designs to develop final resource allocation. Potentially, PPBS would allow administrators to evaluate and compare programs and alternatives. Thus, requests for resources could be justified in terms of expected returns and authority would be restored to the originally intended organizational levels through the reduction of uncertainty in the decisions. While the costs are realized to be significant, the potential benefits also appear to be great. 19 pp. Ref. (MT)

P-4285—"Law as a Tool of Directed Social Change: A Framework for Policymaking," Y. Dror (January 1970).

The use of law as a tool for directed social change is widespread in all contemporary societies, but systematic procedures and understanding are lacking. Only a complex multivariable behavioral analysis can provide the knowledge necessary for wise policy recommendations. The task requires mixed teams of lawyers, social scientists, and policy analysts at various points in the social guidance cluster—the legislature, the executive, research organizations, and universities. It also calls for changes in the policymaking system to permit utilization of the work of such teams, through a broader, more systematic approach to policymaking in general. This, in turn, requires changes in higher education to provide (1) analytical and social science training in the law schools, and (2) special institutes at which interested lawyers, social scientists, and policy analysts acquire a grounding in each other's skills. (Prepared for publication in *The American Behavioral Scientist*, Spring 1970.) 12 pp. (MW)

P-4304—"The University of Texas Dental Branch Independent-Access Television System," R. Bretz (February 1970).

A description of a very advanced electronic instructional system which is at the time of writing in the late stages of construction. Designed for dental laboratory courses, the system will include 100 student stations, each with three-dimensional video, both motion and still, and live 3-D camera equipment of a unique design. Instruction may be programmed in multiple-track or branching formats, and an electronic tablet collects students' constructed responses. Any student may access any of the materials available entirely independently of all other students who are using the same system. The system is unique not only in technical sophistication but in the fact that the designer is both engineer and dental school instructor. 21 pp. (Author)

P-4314—"Urban Metapolicy and Urban Education," Y. Dror (February 1970).

Innovative changes in both urban metapolicy and in urban education are needed to meet present and future urban problems. Metapolicy deals with policies on policymaking, including the characteristics of the policymaking system and basic policy frameworks and postures. Required changes in metapolicy include: (1) development of urban policy sciences knowledge; (2) invention of new urban policy tools; (3) explicit strategy determination; (4) new policy-contributing institutions and/or policy research organizations; (5) improvement of urban policymaking personnel; (6) advancement of citizen participation. Important implications for urban educators: (1) similar improvements in the urban education policymaking subsystem are needed for better urban educational policies. (2) some radical changes in urban education are needed to meet the needs of better urban metapolicies. These include: (1) education of adults for more active roles in urban policymaking; (2) preparation of children for active roles; (3) training of urban policy practitioners for new patterns of urban policymaking; (4) training of new types of urban policy professionals; and (5) development of policy scientists. Urban metapolicy and urban education are interrelated; thus calling for multidimensional reforms. 24 pp. (Author)

P–4317—"Employing the Training Program Enrollee: An Analysis of Employer Personnel Records," D. H. Greenberg (March 1970).

Data for the evaluation of training programs is usually collected directly from former trainees. To explore a less costly, alternative approach, follow-up data was collected from the personnel files of 16 employers of the graduates of 4 Los Angeles training programs. While limited in some ways, these data did permit a comparison of the training programs and did yield some insight into the firm's influence on the post-training experience. The trainees associated with on-the-job training, for example, seem to have been more successful than the graduates of the 3 institutional programs with whom they were compared. Much of the former program's superiority can apparently be traced to a greater ability to place trainees at firms where success is more probable. Within the Los Angeles area, success seems to be most probable at large government contractors and least probable at small companies in highly competitive industries, 27 pp. (Author)

P–4327—"Cost-Effectiveness Analysis for Educational Planning," M. B. Carpenter, S. A. Haggart (March 1970).

Methods of cost-effectiveness analysis can assist the planner in evaluating educational programs. This concept should be broadened to include "resource-effectiveness analysis," which can be divided into two study areas: resource analysis and analysis of effectiveness. Constructing a resource/cost model is suggested to handle the problems of resource allocation by relating the programs to resources and costs. Defining and measuring the effectiveness of an educational program must precede the analysis of cost-effectiveness of alternative programs. The complexity of the learning process requires the production of a set of measures or indicators. Questions remaining: What level of effectiveness is acceptable? Should the same criteria be applied to all students? Results of this resource-effectiveness analysis will be estimated measures of resource requirements, costs, and ranked aspects of effectiveness projected for each program and for alternative future environments. 15 pp. Bibliog. (AR)

P–4343—"Closed Circuit TV and the Education of the Partially Sighted," S. Genensky (March 1970).

Description of Rand-sponsored research resulting in a closed circuit TV system designed to help the legally blind and others with severe visual impairments read and write with near normal proficiency. CCTV can dramatically amplify light and heighten contrast, has a proven capacity to aid the visually handicapped where most optical aids fail, and exhibits great potential for systematic use in educating the partially sighted. It is anticipated that CCTV could also open up many jobs requiring manual precision that are now closed to the visually handicapped. Current components of a prototype model and modifications that will permit a variety of applications are discussed. 18 pp. Ref. (TC)

P–4347—"Communications Satellites, Technology Transfer, and Economic Development," P. L. Jordan (June 1970).

The use of educational television to improve the quality and quantity of education in developing countries is examined. A simple model relating economic development in emerging countries to education and the level of applied technology is presented. The use of television broadcast satellites as a means for improving education systems in developing regions is discussed in the context of competition for scarce resources and the requirement to develop educational software and infrastructure concurrently. 12 pp. Ref. (Author)

P–4360—"Some Considerations in the Experimental Design and Evaluation of Educational Innovations," M. L. Rapp, J. G. Root, G. C. Sumner (April 1970).

The evaluator's task is to relate inputs (in education, the student and school characteristic) to outputs (cognitive or affective changes). The evaluation design is determined by the purpose: to aid decisionmakers in adopting programs, for program improvement, or for better understanding of the educative process. The school information system should be designed specifically for evaluation and resource analysis. Experimental design essentially consists of organizing the observation of various alternatives, and specifying criteria and instruments of measurement that distinguish between program and nonprogram effects. Planning for large-scale application of successful results should proceed alongside research planning, to keep innovations practical in terms of real-world constraints. Thus, random selection is preferable to using volunteer subjects. Nonquantitative as well as quantitative program goals must be evaluated even if new measures must be invented for that purpose. Innovative instructional programs may require innovative evaluation techniques. 12 pp. Ref. (MW)

P–4377—"Multi-Level Information Systems in Education," J. S. Coleman, N. L. Karweit (June 1970).

Surveys educational data needs, existing systems, available computing, and proposes a radically new remote-access computerized file system. Unlike existing management information systems, it provides for differential access by students, parents, teachers, principals, administrators, government officials, and legislators. Data from many schools are entered, sorted, and analyzed. Secondary, college, and work experience of elementary graduates can be included to help determine results. A bonded outside information banker designs the system, monitors input for quality and quantity, processes data, and provides each user with only the information that he is entitled to have: Parents may learn about their own children but not others, taxpayers are entitled to statistical but not individual records, etc. The control rules should be set by law; the legislative hearing is the appropriate arena. This system is designed to aid the emerging pluralistic structure of American education, in which all parties make responsible and informed choices. 118 pp. Ref. (MW)

P–4381—"Information System for Educational Policy and Administration," J. C. Clayton (June 1970).

A talk before the California Association of Independent Schools, Northern Section meeting, describing a proposed modularized Educational Information System (EIS). As a byproduct of clerical functions—scheduling, grade reporting, accounting, inventory control—the EIS creates an information bank for evaluation and forecasting. Given a statement of objectives, the EIS evaluates progress in attaining them. Given a proposed academic decision, it presents the economic and spatial ramifications. Teacher/student combinations and ratios are readily correlated with student achievement to determine which teachers teach most effectively and which students learn most readily under specified conditions. Methods should be adopted, and large-class lecturers and small-group discussion leaders should be chosen on this basis. The data structure is designed to be queried at different levels by headmasters, teachers, business office, trustees, etc., with privacy constraints. Teachers, for instance, would not normally have access to other teachers' salary data. 7 pp. (See also P–4377.) (MW)

P–4385—"The Impact of Grants-in-Aid on State and Local Education Expenditures," S. M. Barro (June 1970).

A method of predicting school district spending per pupil and the effect of alternative forms of school aid. Constrained maximization equations take account of real expenditure per pupil; real school taxes, income taxes, and nonschool property taxes per household; and homeowners' proportion of property tax. The model shows that matching grants stimulate more local expenditure than the customary lump sums. Regardless, impact on spending per pupil is proportional to the number of pupils per household—not to aid per pupil. To predict results of matching grants, states can judge by the response of spending per pupil to changes in costs over time. An incomplete version of the model accounted for some 80 percent of the variance in school expenditure among states in 1954–1966, and—unlike earlier models—gave results consistent from year to year. (An earlier version was presented at the Thirteenth National Conference on School Finance.) 26 pp. Ref. (MW)

P–4396—"Assessing the Effects of Changes in the Cost of Higher Education to the Student," J. S. Dyer (June 1970).

Methodology for estimating the cost of higher education and the student's ability to pay. Comparisons of the ability and cost factors provide estimates of the percentage of potential students who are effectively "priced out" of higher education. Actual data from the public higher education system of Texas are responding to the college student questionnaire are investigated to permit the used. First, major sources of financial support reported by college freshmen approximation of the lognormal distribution function for "expected contribution." These data are combined with cost data relevant to the analysis of policy decisions in higher education. The approach can be used by public or private institutions to study proposed changes in tuition or scholarship policies. The techniques can also be applied to the analysis of the problem of whether to expand existing physical facilities to provide for growing enrollments; or establish new institutions in heavily populated urban centers. 17 pp. (KB)

P–4402—"Color Television in Instruction," R. Bretz (June 1970).

Discusses the reason why educators who have tried instructional color TV are unenthusiastic, while 90 percent of educational films are in color. Basically

the fault lies in the poor quality of present color TV reception and the need for more maintenance time and cost than schools will provide. In another decade these circumstances will probably change. By that time, practical means of measuring affective changes in students may be developed; using them, whatever usefulness color may add to instructional TV can be proved. 7 pp. Ref. (MW)

P-4411—"Educational Information System Design: A Conceptual Framework." F. W. Blackwell, B. W. Boehm, A. W. Chalfant, J. A. Farquhar, B. Markowitz, J. G. Root, A. H. Rosenthal (August 1970).

The success of an educational information system—the processes, methods, and techniques through which educational data are collected, permuted, and dispersed—depends on key decisions made early in the preliminary design phase. These include establishing information-system policies; determining the accuracy, volume, and retrievability of the information to be maintained; and designing and implementing the hardware-software system. The sequential nature of these phases is stressed. Also important is the iteration and feedback between teachers, students, administrators, research teams, and the information-system designers. 17 pp. (ETG)

P-4421—"The Evaluation of Decision-Relevant Attributes of a Public System of Higher Education," J. S. Dyer (July 1970).

Summarizes an empirical evaluation of attributes of two alternative approaches to expanded public higher education in Texas: (1) expansion of existing senior institutions to meet projected enrollment for 1980; (2) construction of new 4-year public institutions. Costs and benefits of higher education were estimated on a per student or per graduate basis and were analyzed relative to both the individual and the state. Results indicate that alternative (1) is cheaper but does not encourage low-income individuals to enroll in the system. Comparison of the effects of the alternatives on the state economy seems to indicate that expected costs would be greater than the benefits. Expansion of higher education does not seem to affect state tax revenues significantly. However, rate of return from higher education is expected to be approximately 10 percent for individuals. No economic values were estimated for "noneconomic" returns from higher education (e.g., increased voting rate and reduced unemployment). 53 pp. Bibliog. (DGS)

P-4434—"Developing Local Educational Indicators—The Priorities," E. A. Hanushek (August 1970).

An outgrowth of the June 1970 Chicago Social Indicators Conference, this paper by an Air Force Academy professor and Rand consultant suggests ways to evaluate the schools. Only in the past 5 years have such attempts been made. Data could be collected fairly cheaply from existing school records on: educational outputs (results), as measured by grade completion, college attendance, achievement scores; family inputs, as measured by parents' education, occupation, and family structure (this may require periodic updating); and school inputs, as measured by school, class and program attendance, specific teachers, and teachers' characteristics. Statistical analysis would enable us to sort out the influences of different factors and to discover what educational inputs produce what outputs. At greater expense, we could use attitude questionnaires and long-term follow-up of students to determine their life patterns, and apply similar statistical analysis. 14 pp. (MW)

P-4456—"The Program Structuring Aspect of PPB for Education," S. A. Haggart (February 1971).

A description of the nature and iterative process of program structuring, which consists of categorizing the activities of education into programs according to their contribution toward meeting education objectives. The program structure provides a format for the program budget. The purpose of this planning is to achieve better educational results by using resources sore effectively. A program structure relates objectives and activities by identifying and measuring objectives, including all activities, and allowing for growth: it also supports decision-making, illuminates priorities, highlights tradeoffs, and promotes realistic analysis by providing imaginative change, and a manageable format. Emphasizing today's need for a program structure closely tied to decisions made at different levels, the program structure must reflect output-oriented programs at higher levels, and program elements at lower ones. The output-oriented programs categorize all activities of the school district. Analysis in program structuring is mostly done at the program-element level. 13 pp. (SM)

P-4457—"Policy Sciences and Policy Research Organizations." C. Wolf, Jr. (September 1970).

Notes on a new type of educational activity at Rand: development of a graduate degree program in policy analysis. Increasing demands are made for trained policy analysts in government, research institutions, universities, and businesses—both domestic and international—whose activities involve public policy choices. In answer to the question of whether a policy research organization can contribute to the supply of well-trained policy analysts, an experimental prototype program is to be conducted at Rand; a small group of staff members will participate as students. other staff members with suitable qualifications will be the faculty. Formal academic work will be combined with direct applications to policy problems, with emphasis on the cross-disciplinary approach. The curriculum to be tested is planned for 9 academic quarters of 10 weeks each. including (10) on-the-job training. (2) a seminar workshop based on current and previous Rand studies. (3) 2 core courses. one in concepts and theory, the other in tools and techniques, and (4) a dissertation requirement. Based largely on the results of the program, a decision will be made on whether to expand the program and make it available to qualified people outside Rand. 10 pp. (KB)

P-4464—"An Approach to Developing Accountability Measures for the Public Schools." S. M. Barro (September 1970).

A general strategy for evaluating pupils' progress so that each educator is held responsible for those outcomes—and only those outcomes—that he can affect. to the extent that he can affect them. The basic statistical technique is multiple regression analysis. Several stages are needed (1) to take account of variation due to the pupils' backgrounds and characteristics, (2) to estimate the remaining interclassroom variations, and (3) to attribute it to particular teachers, other classroom variables, and other school characteristics. In principle, the method can be extended to evaluate the contributions of administrators, provided the district is large enough for adequate comparisons. The interclassroom variation remaining after nonteacher effects have been accounted for is probably the most widely useful measure. Complex econometric models may be required to cope with interaction effects—the effect of problem children on their classmates, or of last year's teacher on this year's performance 30 pp. (MW)

P-4480-1—"Development of Management Scientists." E. P. Durbin. P. W. Greenwood (November 1970).

Rand and Caltech have developed a successful postgraduate curriculum for training management scientists. The first 10-week academic quarter was divided between theory (economics, decision theory, management information systems) and analytic methodology (resource analysis, program budgeting, statistical methods, computer simulation of micro and macro systems), interspersed with Rand studies exemplifying the ideas taught. These studies made the students more demanding of relevant and useful techniques than first-year graduate students usually are. About half the class completed the second quarter, devoted to group research projects—some left because they wanted to work individually. Starting with problems of their choice about which they had only laymen's knowledge, aided by rapid feedback from instructors, the groups quickly defined their problem areas. They became highly involved and knowledgeable regarding their topics, developing remarkable understanding of data sources, real-world constraints, and how policy is actually made. 7 pp. (MW)

P-4517—"Cost-Effectiveness as an Aid to Making Decisions in Education," M. B. Carpenter (December 1970).

Clarifies the application of cost-effectiveness to education, using the Rand studies of education in Colombia as an illustration. Cost-effectiveness can only be judged in comparison with alternatives. Only when inputs and outputs are completely measurable in dollars can a cost-effectiveness study be self-contained. Differences of 10% or less are not significant. Resources must be distinguished from the cost of the resources, especially where the availability of trained personnel is a limiting factor. A single measure of effectiveness cannot meet the needs of all educational decisionmakers, yet single measures are usually offered. Given equal-cost alternatives to consider, the decisionmaker can choose among programs in terms of his own value structure. Equal-effectiveness programs are nearly impossible to construct in education since so much is unquantifiable. (Delivered at the cost-effectiveness seminar for the National Association of Education Broadcasters in Washington. November 1970.) 8 pp. (MV)

P-4528—"The Nonpublic Schools and the Public Purse: A Financial Study of Roman Catholic Schools in Rhode Island," H. J. Kiesling (December 1970).

Faced with declining enrollment and rising costs, U.S. Catholic schools decreased by 5% between 1963 and 1968. Eleven States subsidized nonpublic, church-controlled schools in some way. Public school expenditures in 1967 averaged over $700 per pupil: 15 representative Rhode Island parochial schools spent $103—up from $42 in 1958. This increase reflects living costs of nuns and brothers, a decline in religious vocations causing an increase in lay teachers, and smaller classes, especially in low-income parishes. Yearly fees, averaging $12 for a middle-income parish and $34 for a high-income parish, hardly account for the 13% drop in enrollment. Higher fees in poorer parishes, averaging $42, may account for part of their 27% decline. How to prevent the collapse of religious schools in the U.S. is not clear. But if all their present pupils enroll in public schools, public education costs will increase at least 13%—$3.5 billion—plus at least $500,000,000 for buildings. 25 pp. (MW)

P-4538—"Determinants of the Flow of Physicians to the United States." H. S. Luft (December 1970).

In 1969 over 2300 foreign medical school graduates obtained a license to practice in the U.S. In 1968, 15,582 interns and residents among the 47,494 in U.S. hospitals were foreign educated. The flow of foreign physicians to the U.S. has escalated dramatically in recent years, and today more come from the underdeveloped countries than ever before. This paper detailed statistical backup such as income differentials and other factors affecting migration. Among the conclusions: Prospects for developing nations look dim, as the lure of more money plus an emphasis here and abroad on specialized training exercises its influence to siphon off needed physicians. But, with respect to medical trainees, the situation may not be as bad as it looks: The U.S. receives the physician's services for a number of years, and his home country eventually receives a more highly trained doctor. 118 pp. Bef. (TC)

P-4558—"The Rand/HEW Study of Performance Contracting in Education," G. R. Hall, J. P. Stucker (January 1971).

In simple terms, an educational performance contract is an agreement between a school district and a learning system contractor for the education of a selected group of students, with the contract payment determined by the measured educational achievement of the students. About 100 programs are underway this year. Each program involves remedial reading; many teach mathematics, but only three cover other subjects. Most contractors are profit-oriented educational firms, and are directly involved in the teaching and learning process. Most programs are based on highly individualized instruction and employ a wide spectrum of teaching techniques, materials, and general approaches. It is important that the 1970–71 experience be evaluated with an eye to all the activities involved in the program and the many different impacts they might conceivably exert. HEW has contracted with Rand to conduct one such evaluation. 11 pp. (DGS)

P-4574—"How Shall We Employ the Technically Trained?" V. Gilinsky (February 1971).

A discussion of the present aerospace unemployment as a recurrent problem caused by the manner in which individuals are trained and used to generate technology. We should avoid solutions that do not solve the future operation of the advanced technology sector. Past flexibility meant discarding older, experienced employees in favor of new university graduates. Permanent revitalization of the advanced technology sector is necessary: (1) Reform graduate education by reducing university training to fundamentals. (2) Provide regular access to reeducation. (3) Divide a career into work and study modes. (4) Facilitate changes of professions or occupations by financing adults with families. (5) Control numbers of university graduates through feedback of society's and industry's needs. Possibly industries should provide a limited form of guaranteed employment. The potential of the technically trained is underutilized; society cannot choose wisely among its options if individuals become a disposable commodity. 11 pp. (SM)

P-4576—"Analysis of Educational Programs," M. B. Carpenter (March 1971).

Analysis within a program budgeting system assists in planning and management through 2 functions: it generates realistic descriptions of the resources and processes used by on-going programs to produce educational outcomes; it permits objective comparison of alternative ways to conduct a given program. Two steps are crucial to the analysis: correct problem definition and formulation, and description of alternative problem solutions. Further, a good analysis gives con-

crete evidence that peripheral effects of the alternatives have been ascertained as well as possible, and provides estimates of the cost and effectiveness of those alternatives throughout the probable life of the program. To carry out such an analysis, people are needed who have a thorough knowledge of the educational system, and who use a rational, objective, intellectual approach with a large measure of common sense. 17 pp. Ref. (SM)

P–4584—"Project R–3 Allocation of Students among Groups," G. C. Sumner (February 1971).

A concise description of an objective method for allocating San Jose students into groups so that each group includes the same representation of 2 quantitative measures of scholastic achievement. The conditions provided that each group be internally heterogeneous, and that intergroup differences be small, so that each represented a separate replication of the same experiment. The purpose of the allocation was to mirror uniformly the central tendency and variability of the overall student population. The method could apply to a more flexible set of initial conditions: it could accommodate another variable; it would be equally useful for ensuring representation across socioeconomic or cultural variables; and it obtains proportionality with the racial-ethnic mix of the student population considered. 11 pp. (SM)

P–4595—"Multivariate Analysis of Schools and Educational Policy," H. J. Kiesling (March 1971).

Revised version of a report for the Office of the Assistant Secretary for gram Evaluation, HEW. Production function analysis of education is futile because of data limitations. However, multivariate analysis of available data can yield important policy guidance, if we (1) use comparable measures across experiments, (2) systematically account for socioeconomic differences, and (3) analyze schools as systems rather than studying variable in isolation. We already know, from 15 multivariate analyses, that teacher training seems unrelated to performance, but teachers' verbal intelligence is highly related; mothers' education is an important predictor of children's achievement; ability tracking improves overall achievement, but depressed the lowest group in one study. Researchers should pay more attention to pupil mobility, school management and facilities, audiovisual aids, team teaching, and especially school size. A research plan for a National Institute of Education is outlined. 56 pp. Bibliog. (MW)

P–4596—"Subjective Scaling of Student Performance," T. S. Donaldson (March 1971).

A method for measuring performance increments across a wide range of student performance—specifically, by measuring the student's performance in homework and classroom work. A judge evaluates the achievement level from samples of each student's work collected at the beginning and end of the program. Rating the student's work on an assignment common to all, the judge scores either by intersample relationship or by comparison to an absolute value scale. This exercise evaluates improvements in arithmetic and reading skills and affords a criterion for using the standardized tests. The specific assignment scores can be correlated with the standardized test scores. Although scaling techniques appear to be generally useful in educational evaluations, more basic research is necessary to isolate student performance variables, to study individual teachers' grading biases, to determine the various dimensions of student performance, and to identify performance changes. 15 pp. Ref. (SM)

P–4600—"Instructional Uses of the Computer in Higher Education," R. E. Levien (March 1971).

Some conclusions about developments in the computer's capabilities and costs; methods of providing computer service and instructional materials; and effects of higher education. Two major trends hold special promise: the development of large, centralized computing facilities shared by customers; and the creation of inexpensive minicomputers, using an exchangeable medium such as magnetic tape cassettes. These could provide a market for computer-based instructional materials; such a market is critical in achieving the desirable level of computer use in instruction. National policy should see that access to the computer is possible wherever its use is cost-effective, and that its use is refined and improved to broaden the range of instructional value. The federal government should support (1) R&D on hardware and software, including terminals, minicomputers, and intercomputer communications; (2) development of instructional materials; (3) computer experiments; and (4) consideration of computer requirements in copyright and patent laws and communications industry regulations. 20 pp. (SM)

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